PROGRAM AND ABSTRACTS

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Director, Pediatric Neurosurgery Unit, Rambam Health Care Campus, Haifa

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Dept. of Neurosurgery Tel Aviv Sourasky Medical Center, Tel Aviv

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ACKNOWLEDGEMENTS

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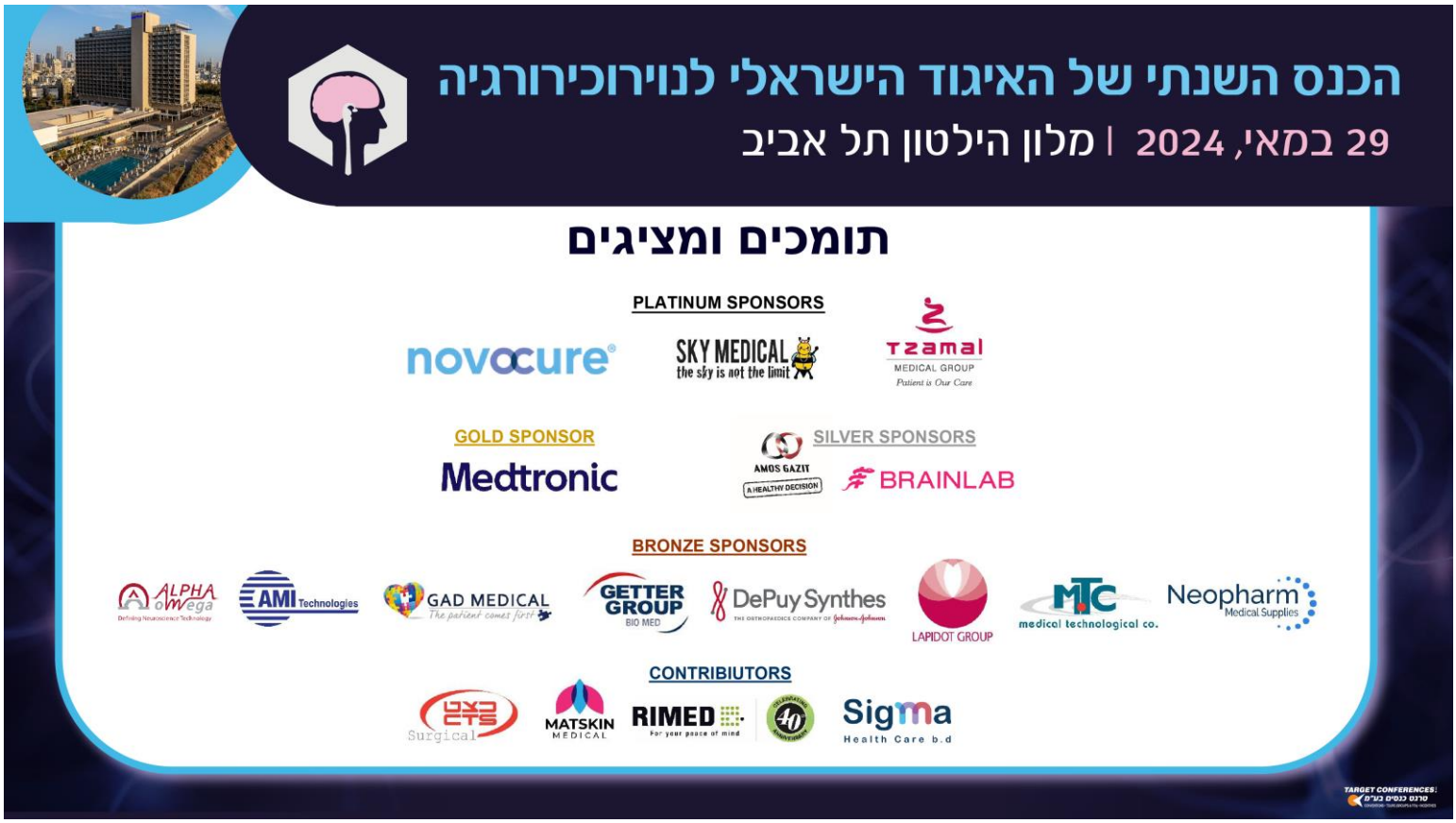

SCIENTIFIC PROGRAM

Wednesday, May 29, 2024

08:00 *Registration, Coffee and Visit the Exhibition*

08:30-09:30 **Session I - FREE PAPERS**

Chairs: **Uzi Ben David**
Jacob Zauberman

08:30 Traumatic Cerebral Venous Sinus Thrombosis in Adults: A Retrospective Study from a Large Tertiary Center Experience
Segev Gabay[1], Guy Shemesh Dunetz[1], Lottem Bergman[1], Jonathan Roth[1,2]
[1]Neurosurgery, Tel Aviv Medical Center, Tel Aviv, [2]Tel Aviv University, Sackler Faculty of Medicine, Tel Aviv, Israel

08:35 Transport to Computerized Tomography in the Neurosurgical Intensive Care Unit Carries a One in Five Chance of Complications
Ravit Gabay Yehezkely[1,2], **David Shaked Zari[1,2]**, Iddo Paldor[3,4]
[1]Dept. of Neurosurgery, Rambam Medical Center, Haifa, [2]The Ruth and Bruce Rappaport Faculty of Medicine, Technion Israel Institute of Technology, Haifa, [3]Dept. of Neurosurgery, Shaare Zedek Medical Center, Jerusalem, [4]The Faculty of Medicine, The Hebrew University, Jerusalem, Israel

08:40 Stented Endoscopic Third Ventriculostomy - A Multicenter Study
Lee Azolai[1], Shlomi Constantini[1], Lidor Bitan[1], Ulrich-Wilhelm Thomale[2], Henry W. S. Schroeder[3], Petr Vacek[4], Jonathan Roth[1]
[1]Departments of Neurosurgery and Pediatric Neurosurgery, Dana Children's Hospital, Ichilov Medical Center, Tel Aviv, Israel; [2]Pediatric Neurosurgery, Charite University of Medicine, Berlin, Germany; [3]Department of Neurosurgery, University Medicine Greifswald, Greifswald, Germany; [4]Department of Neurosurgery, Charles University, Plzen, Czech Republic

08:45 Colloid Cyst, the Algorithm Decision for Surgical Management
Firas Jbareen, Gustavo Rajz, Nevo Margalit
Neurosurgery, Shaare-Zedek Medical Center, Jerusalem, Israel

08:50 Brainstem Cavernous Malformations - A Single Center Case Series of 5 Surgically Treated Patients Between 2023-2024
Haggai Suisa
Neurosurgery, Galilee Medical Center, Nahariya, Israel

SCIENTIFIC PROGRAM

Wednesday, May 29, 2024

08:30-09:30	**Session I - FREE PAPERS (cont.)**

08:55 The Role of ICP Monitoring and Decompressive Craniectomy in War-Related TBI

Yevgeny Karepov[1], Jane Skidan[1], Mohamad Hmaeed Asdi[1], Orit Lesman-Segev[2,3,4], Avital Perry[2,5], Yael Rosen Lang[2], Anton Peled[5], Israel Melamed[7], Elad Avraham[6], Amit Azriel[6], Tomer Talmy[7,8], Saadit Sarah Houri[9], Raquel C. Gardner[2], Guy Rosenthal[9]
[1]Dept. of Neurosurgery, Tel Aviv Sourasky Medical Center, Tel Aviv, [2]Sagol Neuroscience Center, Sheba Medical Center, Ramat Gan, [3]Faculty of Medical and Health Science, Tel Aviv University, Tel Aviv, [4]Dept. of Diagnostic Imaging, Sheba Medical Center, Ramat Gan, [5]Neurosurgery, Sheba Medical Center, Ramat Gan, [6]Neurosurgery, Soroka Medical Center, Beersheba, [7]Division of Anesthesia, Intensive Care and Pain Management, Tel Aviv Sourasky Medical Center, Tel Aviv, [8]Israel Defense Forces Medical Corps, IDF, Ramat Gan, [9]Neurosurgery, Hadassah Medical Center, Hebrew University of Jerusalem, Jerusalem, Israel

09:00 Characterization of Intraoperative 5-ALA Fluorescence in Patients with Post-Radiation Brain Necrosis

Yevgeny Karepov[1], Segev Gabay[1], Rachel Grossman[2,3]
[1]Dept. of Neurosurgery, Tel Aviv Sourasky Medical Center, Tel Aviv, [2]Neurosurgery, Tel Aviv Sourasky Medical Center, Tel Aviv, [3]Dept. of Neurosurgery, Rambam Health Care Campus, Haifa, Israel

FLASH TALKS

09:05 Vagal Nerve Activity Predicts Prognosis in Glioblastoma

Niv Katan[1], Nur Mansur[1], Yuri Gidron[2], Rachel Grossman[1]
[1]Dept. of Neurosurgery, Rambam Health Care Campus, Haifa, [2]Dept. of Nursing, Faculty of social Welfare and Sciences, University of Haifa, Haifa, Israel

09:08 Challenges and Strategies in Surgical Management of Meningiomas Involving Large Venous Sinuses - A Local Experience

Ali Alkasim Kaadan[1], Jean Francois Soustiel
Neurosurgery, Galilee Medical Center, Nahariya, Israel

SCIENTIFIC PROGRAM

Wednesday, May 29, 2024

08:30-09:30	**Session I - FREE PAPERS (cont.)**
09:11	Spontaneous Acute Subdural Hematoma, Case Series and Review of the Literature **Segev Gabay[1]**, Anatoly Budylev[2], Lior Gonen[1,3] [1]Neurosurgery, [2]Radiology, Tel Aviv Medical Center, Tel Aviv, [3]Tel Aviv University, Tel Aviv, Israel
09:14	Thinking Out of the Box Multifaceted Diagnosis and Management of Chronic Subdural Hemorrhage **Ali Alkasim Kaadan**, Yoval Gruber Neurosurgery, Galilee Medical center, Nahariya, Israel
09:17	How to Reduce Hydrocephalus Rate in Children with Posterior Fossa Tumor **Naama Turner[1]**, Liat Oren[2], Vladimir Shapira[1], Ravit Gabay-Yehezkely[1], Amalia Elkin[1], Mony Benifla[1] [1]The Pediatric Neurosurgery Unit, Rambam Health Care Campus, Haifa, [2]The Pediatric Hemato-Oncology Dept., Rambam Health Care Campus, Haifa, Israel
09:20	Incidental Posterior-fossa Ependymoma in a Myelomeningocele Patient **Haggai Suisa**, Sergey Abeshaus Neurosurgery, Galilee Medical Center, Nahariya, Israel
09:23	Discussion

09:30-10:00	**OPENING SESSION**
	Welcome and Opening Remarks **Mony Benifla**, President, Israeli Neurosurgical Society Annual Report **Iddo Paldor**, Secretary, Israeli Neurosurgical Society Financial Report **Ido Strauss**, Treasurer, Israeli Neurosurgical Society

SCIENTIFIC PROGRAM (cont.)

Wednesday, May 29, 2024

10:00-10:30	**GUEST SPEAKER**
	Chair: **Israel Melamed**
10:00	October 7th - Mass Casualty Event **Amit Frenkel**, Critical Care Outreach Unit, General Intensive Care Dept., Soroka University Medical Center, Beer-Sheva
10:30	*Coffee Break and Visit the Exhibition*
11:00-12:00	**Session II - MY WORST DISASTER**
	Chairs: **Iddo Paldor** **Andrew Kaye** Panelists: **Nachshon Knoller** Spine Surgery Unit, Sheba Medical Center, Ramat Gan **Jean F. Soustiel** Dept. of Neurosurgery, Galilee Medical Center, Nahariya **Nevo Margalit** Dept. of Neurosurgery, Shaare Zedek Medical Center, Jerusalem **Zvi Israel** Dept. of Neurosurgery, Hadassah Hebrew University Medical Center, Jerusalem Discussion
12:00-13:00	**GUEST SPEAKER**
	Chair: **Mony Benifla** I Think, Therefore I Err (אני חושב משמע אני טועה) **Haim Shapira** - Israeli Mathematician, Pianist, Speaker, Philosopher and Game Theorist
13:00	*Lunch and Visit the Exhibition*

SCIENTIFIC PROGRAM (cont.)

Wednesday, May 29, 2024

13:45-15:15	**Session III - CONTROVERSIES**

Chairs: **Eyal Itshayek**
Yigal Shoshan

Spinal Fusion for Degenerative Lumbar Disease
Morsi Khashan - Pro
Dept. of Neurosurgery of the Tel Aviv Sourasky Medical Center, Ichilov
Gill E. Sviri - Against
Dept. of Neurosurgery, Rambam Healthcare Campus, Haifa

ICP Neuromonitoring in Severe TBI
Guy Rosenthal - Pro
Dept. of Neurosurgery, Hadassah Hebrew University Medical Center, Jerusalem
Nachshon Knoller - Against
Spine Surgery Unit, Sheba Medical Center, Ramat Gan

15:15-15:25	**BEST PAPER AWARDS** - *Sponsored by **Tzamal Medical***

Chairs: **Mony Benifla**
Ido Strauss

Best Resident Clinical Research Awards

15:15 Follow Up Brain US as an Alternative to CT Scan in Infants with Traumatic Intracranial Bleed
Naama Turner[1], Mika Shapira-Rootman[2], Anat Ilivitzky[2], Ayelet Eran[2], Amalia Elkin[1], Mony Benifla[1]
[1]The Pediatric Neurosurgery Unit, [2]Dept. of Radiology, Rambam Health Care Campus, Haifa, Israel

15:20 Flow Diverter with Surface Modification and Single Anti Platelet in the Management of Ruptured Intracranial Aneurysms- Multicentric Preliminary Experience
Zurita Marco[1], Khanafer Ali[2], Leah Kahanov[1], Sirakov Alexander[3], Henkes Hans[2], Cohen Jose E.[1]
[1]Neurosurgery, Hadassah Hebrew University Hospital, Jerusalem, Israel; [2]Neuroradiology Dept., Klinikum Stuttgart, Stuttgart, Germany; [3]Radiology Dept., UH St Ivan Rilski, Sofia, Bulgaria

15:25 *Coffee Break and Visit the Exhibition*

SCIENTIFIC PROGRAM (cont.)

Wednesday, May 29, 2024

15:40-17:35 Session IV - FREE PAPERS

Chairs: **Tehila Kaisman-Elbaz**
Samuel Moscovici

15:40 MRI-Guided Laser Interstitial Thermal Therapy for Treatment of Hypothalamic Hamartoma - TLVMC Experience

Lottem Bergman[1], Orna Aizenstein[2,3], Lilach Goldstein[4,3], Firas Fahoum[4,3], Anat Gauzman[5,6], Miryam Attias[5], Shimrit Uliel-Sibony[7,3], Jonathan Roth[5,3], Ido Strauss[5,3]
[1]Dept. of Neurosurgery, Tel Aviv Medical Center, Tel Aviv-Yafo, [2]Neuroradiology Unit, Dept. of Radiology, Tel Aviv Medical Center, Tel Aviv-Yafo, [3]Tel Aviv School of Medicine, Tel Aviv University, Tel Aviv-Yafo, [4]Epilepsy Unit, Dept. of Neurology, Tel Aviv Medical Center, Tel Aviv-Yafo, [5]Functional Neurosurgery Unit, Dept. of Neurosurgery, Tel Aviv Medical Center, Tel Aviv-Yafo, [6]Dept. of Pediatric Neurosurgery, Dana Children's Hospital, Tel Aviv Medical Center, Tel Aviv-Yafo, [7]Epilepsy Unit, Dana Children's Hospital, Tel Aviv Medical Center, Tel Aviv-Yafo, Israel

15:45 Long-Term Outcome of Mild Traumatic Brain Injury Among Young Adults

Aya Mudrik[1], Amit Azriel[2,1], Mai Ofri[1,3], Nave Paran[3], Elad Avraham[2,1], Yuval Sufaro[2,1], Israel Melamed[2,1]
[1]Faculty of Health Sciences, Ben Gurion University of the Negev, Beer-Sheva, [2]Dept. of Neurosurgery, Soroka University Medical Center, Beer-Sheva, [3]Clinical Research Center, Soroka University Medical Center, Beer-Sheva, Israel

15:50 Stereotactic Radiosurgery for Brain Metastases Arising from Gynecological Malignancies

Philip Blumenfeld[1], Yoni Shopen[1], Marc Wygoda[1], Aron Popovtzer[1], Tal Falick Michaeli[1], Yigal Shoshan[2]
[1]Radiation Oncology, [2]Neurosurgery, Hadassah Medical Center, Jerusalem, Israel

SCIENTIFIC PROGRAM (cont.)

Wednesday, May 29, 2024

15:40-17:35 **Session IV - FREE PAPERS (cont.)**

15:55 Favorable Patients' Outcomes Following Stereotactic Radiosurgery and Surgical Intervention for Brain Metastases of the Motor Cortex

Diana C. Bolivar V.[1], **Jose A. Asprilla Gonzalez[1]**, Guy Dumanis[1], Paz Kelmer[1], Shachar Shemes[1], Zvi R. Cohen[1], Zion Zibly[1], Anton Wohl[1], Uzi Nissim[1], Roberto Spigelmann[1], Alisa Talianski[2], Yaacov R. Lawrence[3], Amos Stemmer[4], Ory Haisraely[2,3], Tehila Kaisman-Elbaz[1]
[1]Neurosurgery, [2]Neuro-Oncology Unit, [3]The Dept. of Radiotherapy, [4]The Dept. of Oncology, Sheba Medical Center, Ramat Gan, Israel

16:00 The Effects of Congenital Cervical Spinal Stenosis on the Incidence and Severity of Degenerative Cervical Myelopathy

Leah Morejon, Uri Hadelsberg, Andres Vargas, Jonathan Segal, **Leah Morejon**
Neurosurgery, Hadassah Ein Kerem, Jerusalem, Israel

16:05 Hydrocephalus Management Protocol for Children with Posterior Fossa Tumors. A Pilot Single-Center Study

Miki Klaiman, Noa Schwartz, Amir Kershenovich, Ido Ben Zvi
Neurosurgery, Schneider Children's Medical Center of Israel, Petah Tikva, Israel

16:10 Early Surgical Intervention in Non-functioning Pituitary Macroadenomas in Adult Patients Without Optic Apparatus Compression - Should We Consider It? A Matched Case-control Study

Yuval Sufaro[1,2], Elad Avraham[1,2], **Moshe Shmueli[1]**, Nave Paran[3], Talya Blumkine[2], Israel Melamed[4], Merav Frenkel[5,2], Amit Azriel[6,2]
[1]Dept. of Neurosurgery, Soroka University Medical Center, Beer Sheva, [2]Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer Sheva, [3]Clinical Research Center, Soroka University Medical Center, Beer Sheva, [4]Clinical Research Center, Soroka University Medical Center, Beer Sheva, [5]Dept. of Endocrinology, Soroka University Medical Center, Beer Sheva, [6]Dept. of Neurosurgery, Ben-Gurion University of the Negev, Beer Sheva, Israel

SCIENTIFIC PROGRAM (cont.)

Wednesday, May 29, 2024

15:40-17:35	**Session IV - FREE PAPERS (cont.)**

16:15 Latest News from 10 Years of MRgFUS

Lior Lev-Tov[1,2,3], Alon Sinai[1], Noam Shalem[3], Maria Nassar[4], Inna Senderova[4], Ayelet Eran[5], Ilana Schlesinger[4,2]

[1]Neurosurgery, Rambam, Haifa, Israel; [2]Faculty of Medicine, Technion, Haifa, [3]Faculty of Biomedical Emgineering, Technion, Haifa, [4]Neurology, Rambam, Haifa, Israel; [5]Radiology, Rambam, Haifa, Israel

16:20 Embolization vs Stereotactic Radiosurgery for Arteriovenous Malformations in Children. A Comparative Trial Between Two Large Referral Centers

Yuval Rimoni[1], Gregory James[2], Noa Schwartz[1], Fergus Robertson[3], Adam Rennie[3], Eliahu Perlow[4], Dulanka Silva[2], Amir Kershenovich[1], Ido Ben Zvi[1]

[1]Neurosurgery, Schneider Children's Medical Center of Israel, Petah Tikva, Israel; [2]Neurosurgery, Great Ormond St Hospital, London, UK; [3]Interventional Neuroradiology, Great Ormond St Hospital, London, UK; [4]Interventional Neuroradiology, Schneider Children's Medical Center of Israel, Petah Tikva, Israel

16:25 Electrophysiology of the Subthalamic Nucleus. Parkinson's Disease vs Essential Tremor

Halen Baker Erdman[1], Juan Leon[2], Glowinsky Stefanie[1], Heyman Sammy[2], Bergman Hagai[1,2], **Zvi Israel[2]**

[1]Medical Neurobiology, HUJI, Jerusalem, Israel; [2]Neurosurgery, Hadassah Medical Organization, Jerusalem, Israel

16:30 Personalized Tremor Control Targeting for MRgFUS Using Tractography

Noam Shalem[1,2,3], Alon Sinai[1], Gil Zur[4,5], Gal Carmely[3], Haim Azhari[3], Ayelet Eran[4], Ilana Schlesinger[2], Lior Lev-Tov[1,3,5]

[1]Neurosurgery, Rambam Health Care Campus, Haifa, [2]Neurology, Rambam Health Care Campus, Haifa, [3]Faculty of Biomedical Engineering, Technion - IIT, Haifa, [4]Radiology, Rambam Health Care Campus, Haifa, [5]Faculty of Medicine, Technion - IIT, Haifa, Israel

SCIENTIFIC PROGRAM (cont.)

Wednesday, May 29, 2024

15:40-17:35	**Session IV - FREE PAPERS (cont.)**

16 35 Common Data Elements in War-Related Penetrating Traumatic Brain Injuries
Saadit Houri[1], Raquel Gardner[2], Anton Peled[3], Avital Perry[3], Elad Avraham[4], Yevgeny Karepov[5], Mohamad Hmaeed Asdi[5], Israel Melamed[4], Leah Morichon[1], Rotem Hershkovitz[1], **Guy Rosenthal[1]**
[1]Dept. of Neurosurgery, Hadassah-Hebrew University Medical Center, Jerusalem, [2]Joseph Sagol Neuroscience Center, Sheba Medical Center, Ramat Gan, [3]Dept. of Neurosurgery, Sheba Medical Center, Ramat Gan, [4]Dept. of Neurosurgery, Soroka Medical Center, Beer Sheva, [5]Dept. of Neurosurgery, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel

16:40 The New Guidelines for Penetrating Traumatic Brain Injuries - A Preview
Guy Rosenthal
Dept. of Neurosurgery, Hadassah-Hebrew University Medical Center, Jerusalem, Israel

16:45 Near Infrared Optical Molecular Imaging in Neurosurgery. Moving Towards Clinical Translation with a Novel Nerve-Specific Binding Phenoxazine-Based Fluorophore
Amir Kershenovich[1], Connor W Barth[2], Wang Lei G[2,3], Gibbs Summer L[3,2]
[1]Pediatric Neurosurgery, Schneider Children's Medical Center of Israel, Petah Tikva, Israel; [2]None, Trace Biosciences, Portland, Oregon, USA; [3]Biomedical Engineering, Oregon Health and Science University, Portland, Oregon, USA

16:50 Decision-Making in War-Related Severe Penetrating Cranio-Cerebral Injury
Elad Avraham[1], Amit Azriel[1], Micky Gidon[1], Vladimir Merkin[1], Yuval Sufaro[1], **Farouq Alguayn[1]**, Rashad Naamna[1], Antonio Houry[1], Subhi Abu Zaid[1], Alexander Zlotnik[2], Moti Klein[2], Michael Dubilet[2], Evgeny Brotfein[2], Amit Frenkel[2], Ohad Gabay[2], Leonid Koifman[2], Ron Gal[2], Ruslan Kurtz[2], Yaniv Almog[3], Lior Fuks[3], Ori Galante[3], Slutsky Tzachi[4], Dan Schwartzfox[4]
[1]Neurosurgery, Soroka University Medical Center, Beer Sheva, [2]Anesthesiology and GIC Division, Soroka University Medical Center, Beer Sheva, [3]Internal Medicine ICU, Soroka University Medical Center, Beer Sheva, [4]Emergency Medicine, Soroka University Medical Center, Beer Sheva, Israel

16:55 Discussion

SCIENTIFIC PROGRAM (cont.)

Wednesday, May 29, 2024

15:40-17:35 **Session IV - FREE PAPERS (cont.)**

FLASH TALKS

17:00 Laser Interstitial Thermal Therapy for Pediatric Low-Grade Glioma, Case Presentations and Lessons Learned
Ido Strauss[1], **Segev Gabay[1]**, Roth Jonathan[1]
[1]Neurosurgery, Tel Aviv Medical Center, Tel Aviv, Israel

17:03 Central intracranial Epidermoid Cyst Resection through the Infratranstentorial Subtemporal Approach - Case Series of 15 Patients
Waed Masalha[1], Sergey Spector[1], Andrew Kaye[1], Jose Cohen[1], Samuel Moscovici[1]
[1]Neurosurgery, Hadassah medical center, Israel, Israel

17:06 Acute Spontaneous Spinal Subdural Hematoma- A Case Report
Wassim Mazarieb[1], **David Shaked Zari[1,2]**, Shadi Hayek[1], Gill E. Sviri[1]
[1]Neurosurgery, Rambam Medical Center, Haifa, [2]The Ruth and Bruce Rappaport Faculty of Medicine, Technion Israel Institute of Technology, Haifa, Israel

17:09 Multiple slit durotomies in decompressive craniectomies for reduction of severe intracranial hypertension in children
Noa Schwartz, Ivan Novitsky, Ido Ben Zvi, Amir Kershenovich
Neurosurgery, Schneider Children's Medical Center of Israel, Petah Tikva, Israel

17:12 Learning Curve in Robotic Stereoelectroencephalography
Sami Heymann, Zvi Israel
Dept. of Neurosurgery, Hadassah Medical Center, Jerusalem, Israel

17:15 Evacuation of CSDH, Best Approach Anterior or Posterior.
Abed Siag[1], Israel Melamed[2], Rimah Yousef[3], Elad Avraham[4]
[1]Neurosurgery, Soroka Medical Center, Shari Zedek Medical Center, Beer Sheva, Jerusalem, [2]Neurosurgery, Soroka Medical Center, Beer Sheva, [3]Pediatric, Soroka Medical Center, Beer Sheva, [4]Neurosurgery, Soroka Medical Center, Beer Sheva, Israel

17:18 The Path of Endovascular Stroke Treatment from Intraarterial Thrombolysis to Stentriever Mechanical Thrombectomy
Maria del Pilar Anleu Saravia[1], Marco Zurita[1], Samuel Moscovici[1], Andres Vargas[1], Hans Henkes[2], Jose Cohen[1]
[1]Neurosurgery, Hadassah Ein Kerem, Jerusalem, Israel; [2]Neuroradiology, Neuroradiological Clinic, Klinikum Stuttgart., Stuttgart, Germany

SCIENTIFIC PROGRAM (cont.)

Wednesday, May 29, 2024

15:40-17:35	**Session IV - FREE PAPERS (cont.)**
17:21	What You Want to Know About Endovascular Therapy in Acute Ischemic Stroke - Part I and II **Maria del Pilar Anleu Saravia**, Rotem Hershkovitch, Moatasm Shweiki, Raslan Abu Jusin, Jose Cohen Neurosurgery, Hadassah Ein Kerem, Jerusalem, Israel
17:24	Discussion
17:35	*End of Day's Sessions*

ABSTRACTS

Traumatic Cerebral Venous Sinus Thrombosis in Adults: A Retrospective Study from a Large Tertiary Center Experience

Segev Gabay[1], Guy Shemesh Dunetz[1], Lottem Bergman[1], Jonathan Roth[1,2]
[1]Neurosurgery, Tel Aviv Medical Center, Tel Aviv; [2]Tel Aviv University, Sackler Faculty of Medicine, Tel Aviv, Israel

Objective: Cerebral venous sinus thrombosis (CVST) can carry significant morbidity. Head trauma is a major risk factor for CVST. However, there is much uncertainty regarding the natural history and clinical importance of traumatic CVST. The current study aims to review our experience treating patients with traumatic CVST.
Methods: In a retrospective study between January 2017 and March 2023, a total of 95 adult patients with mild, blunt, isolated traumatic brain injury (GCS 13-15), and cranium fracture traversing major dural venous sinus were included. Data regarding presentation, radiological features, hospitalization, and follow-up course of CVST were collected.
Results: Of 95 patients, 31 patients (32%) were identified with CVST as interpreted by the radiologist. Among them, 14 were treated with anticoagulation, and 1 patient was treated with anti-aggregates for concomitant arterial dissection. There were no long-term symptoms or newly diagnosed CVST amongst the entire cohort. No major morbidity or mortality were observed either. Retrospectively evaluating images of 31 patients with presumed CVST, 6 were not deemed to have a CVST but a small compressing epidural hematoma.
Conclusions: Amongst patients with mild, isolated, blunt traumatic brain injury, with a fracture traversing major dural venous sinus and an underlying CVST, the prognosis was excellent regardless of treatment with anticoagulants. As CVST may resemble a sinus compressed by an epidural hematoma, treatment with anticoagulants should not be automatically administered.

Transport to Computerized Tomography in the Neurosurgical Intensive Care Unit Carries a One in Five Chance of Complications

Ravit Gabay Yehezkely[1,2], **David Shaked Zari[2,3]**, Iddo Paldor[4,5]
[1]Department of Neurosurgery, Rambam Medical Center, Haifa; [2]The Ruth and Bruce Rappaport Faculty of Medicine, Technion Israel Institute of Technology, Haifa;
[3]N, Rambam Medical Center, Haifa, Israel; [4]Department of Neurosurgery, Shaare Zedek Medical Center, Jerusalem; [5]The Faculty of Medicine, The Hebrew University, Jerusalem, Israel

Objective: Computerized tomography (CT) scans are routinely employed in the follow-up and management of critically ill neurosurgical patients. Although widely in use the short-term complications of CT scans have not been reported. Although the risks of radiation exposure and contrast material have been explored and described, less attention is given to in-hospital transport (IHT), which itself can cause a series of adverse events, and needs to be taken under consideration in these unstable patients. In this single-center observational study, we aimed to examine and stratify the adverse events occurring during IHT to head CT scans from the Neurosurgical Intensive care unit (NICU).
Methods: We retrospectively reviewed our prospectively collected NICU database, to identify all sedated and intubated patients, who were transported from the NICU to a CT scan between January 1st, 2019, and the end of September 2022. We then reviewed the patient's electronic medical records and classified complications of transport as major and minor complications.
Results: 422 patients were transported to CT while intubated and sedated. Altogether, 78 patients suffered complications of transport (18.5%). Fourteen patients suffered major complications (3.3%) including Extubation/removal of a tracheostomy, Removal of a ventriculostomy or an ICP monitor, Extraction of a central line, and Fall of the patient from the bed. Sixty-four patients suffered minor complications (15.2%) including Removal of a peripheral venous line, Removal of an arterial line (AL), Removal of an indwelling urinary catheter (IDC), and opening of surgical wounds requiring suturing.
Conclusions: CT scans are not an innocent tool for diagnosis and carry risks of their own. this study demonstrates that the necessity and timing of CT scans should be considered in a patient-specific manner, besides a thorough neurological examination, and never as a substitute for it, while taking the risks of the transport itself into account.

Stented Endoscopic Third Ventriculostomy - A Multicenter Study

Lee Azolai[1], Shlomi Constantini[1], Lidor Bitan[1], Ulrich-Wilhelm Thomale[2], Henry W. S. Schroeder[3], Petr Vacek[4], Jonathan Roth[1]

[1]Departments of Neurosurgery and Pediatric Neurosurgery, Dana Children's Hospital, Ichilov Medical Center, Tel Aviv, Israel; [2]Pediatric Neurosurgery, Charite University of Medicine, Berlin, Germany; [3]Department of Neurosurgery, University Medicine Greifswald, Greifswald, Germany; [4]Department of Neurosurgery, Charles University, Plzen, Czech Republic

Objective: Hydrocephalus is one of the most common pathologies in pediatric neurosurgery. ETV is an effective treatment for obstructive hydrocephalus, by creating an alternative pathway between the ventricles and the subarachnoid space (SAS). Secondary stoma closer is the most common reason for late ETV failure, and mostly occurs secondary to local scarring. Local stents aimed to maintain patency are rarely used. In this study we summarize the experience using stents, their efficacy and safety.

Material and Methods: Data was retrospectively collected from all consecutive patients that underwent ETV and stent

at 4 different centers. Collected data included indications for using stented ETV (sETV), hydrocephalic history, surgical technique, outcomes, and complications.

Results: 67 cases were included. 27 had a secondary sETV (following a prior shunt, ETV or both), and 40 had a primary sETV. Average age during surgery was 22 years (0.7-77 years). Main etiologies for sETV included an adjacent tumor (15), thick or redundant third ventricle floor (21), and prior ETV failure (16). Complications included a subdural hygroma (4), postoperative CSF leak (2), and malposition (1). 8 patients had sETV failure, at an average of 9 months following surgery. Reasons for failure included obstruction of the stent (2), massive hygroma (1), diffuse tumor (1), absorption insufficiency (2), infection and CSF leak (2). There were no complications associated with 2 stent removals.

Conclusion: Stented ETV may be indicated in selected cases such as patients with prior ETV failure related to local scarring, or as a primary treatment especially when there is an adjacent tumor which may grow and obstruct the stoma, or a thick or redundant tuber cinereum. sETV was not associated with increased surgical risks.

Colloid Cyst, the Decision Algorithm for Surgical Management

Firas Jbareen, Gustavo Rajz, Nevo Margalit
[1]Neurosurgery, Shaare-Zedek Medical Center, Jerusalem, Israel

Introduction: Colloid cysts are rare benign tumors of the anterior Third ventricle. It is a neuroepithelial cyst that can obstruct the foramina of Monro thereby resulting in obstructive hydrocephalus of the lateral ventricles.
In this series we try to list the indications for surgical treatment and review the recent literature. We analyze the anatomical relation between the colloid cyst and its position relative to the foramina of Monro.
Methods: Nine cases were surgically treated since 2017. Pre and postop imaging as well as patient files were reviewed. We classified the position of the colloid cyst according to the classification described by Beaumont i.e. Zone I, II and III.
Results: The age range was 21- 68 (mean 39) years, F:M 4:5.
Five presented with hydrocephalus, 4 of them required emergency CSF diversion.
In 7 patients the colloid cyst was found to be in "Zone I".
In 5 patients there was no flow in the foramina of Monro.
All cases that had hydrocephalus, no CSF flow, and a colloid cyst in Zone I were symptomatic and 2 presented with decreased sensorium.
Discussion: Scarce literature is found regarding the conservative management of colloid cysts and factors that may put the patients at risk of developing acute hydrocephalus. The indication for surgery is clear in the Zone I group but unclear for the Zone II group. In our series the size of the colloid cyst did not appear to determine the need for surgical intervention but has been found to be an important factor in previous studies.
Conclusion: We found a direct correlation between the location of the cyst (Zone I) , the development of hydrocephalus and lack of CSF flow on MRI.
Further studies assessing preoperative and postoperative investigations could determine the need for surgery in Zone II cysts.

Brainstem Cavernous Malformations - A Single Center Case Series of 5 Surgically Treated Patients Between 2023-2024

Haggai Suisa
Neurosurgery, Galilee Medical Center, Nahariya, Israel

Background: Cavernous malformations are the second most common type of vascular CNS lesion. 15% involve the brainstem and basal ganglia. While convexity cavernous malformations are more likely to manifest with seizures, brainstem cavernous malformations are more likely to manifest with hemorrhage and focal deficits. Deficits from the first episode of hemorrhage tend to resolve as the hemorrhage is absorbed. In contrast, recurrent episodes are associated with progressive deficits. Although surgery may cure the patient, resection of these lesions is associated with a high risk.
Objective: To describe different clinical characteristics of 5 consecutive cases of surgically treated brainstem cavernomas at our institution during the past year (2023-2024).
Methods: Retrospective review of patient charts – surgically treated patients with brainstem cavernous malformation admitted to our hospital during the past year (2023-2024).
Results: The most common location was the Pons (3/5). Mean age at presentation was 35 (3 females and 2 males). Average size was 14.4 mm. The most common complaints on presentation were abducens palsy and contralateral hemihypoesthesia. The most common surgical approach was the retrosigmoid approach. Medical history was nonrevealing apart from one patient who had renal cysts and a second, thalamic cavernoma. Average operating time was 6.5 hours. Average hospitalization time was 11.6 days. 3/5 patients required intensive rehabilitation. new postoperative deficits developed in 3/5 patients and mainly included new cranial neuropathy. 4/5 had no residual lesion. Long term sequelae included mild contralateral paresthesia and diplopia.
Conclusion: To date, the largest series of surgically treated brainstem cavernomas is that of Abla et al, which included 300 patients. Female to male ratio was 1.5, mean age was 41.8. 20% of patients had more than one lesion. The most common location was the pons, with 43.1% of cases. Average size was 18mm. The most common presentation was cranial neuropathy (63%) and sensory deficits (53%). The most common approach was the retrosigmoid approach. New postoperative deficit developed in 53%, most commonly cranial neuropathy. 11 patients were suspicious for residual/recurrent disease. To conclude, the demographic and clinical characteristics in our case series share a similarity with the largest case series to date.

The Role of ICP Monitoring and Decompressive Craniectomy in War-related TBI

Yevgeny Karepov[1], Jane Skidan[2], Mohamad Hmaeed Asdi[2], Orit Lesman-Segev[3,4,5], Avital Perry[3,6], Yael Rosen Lang[3], Anton Peled[6], Israel Melamed[7], Elad Avraham[7], Amit Azriel[7], Tomer Talmy[8,9], Saadit Sarah Houri[10], Raquel C. Gardner[3], Guy Rosenthal[10]
[1]Department of Neurosurgery, Tel Aviv Sourasky Medical Center, Tel Aviv; [2]Neurosurgery, Tel Aviv Sourasky Medical Center, Tel Aviv; [3]Sagol Neuroscience Center, Sheba Medical Center, Ramat Gan; [4]Faculty of Medical and Health Science, Tel Aviv University, Tel Aviv; [5]Department of Diagnostic Imaging, Sheba Medical Center, Ramat Gan; [6]Neurosurgery, Sheba Medical Center, Ramat Gan; [7]Neurosurgery, Soroka Medical Center, Beersheba; [8]Division of Anesthesia, Intensive Care and Pain Management, Tel Aviv Sourasky Medical Center, Tel Aviv; [9]Israel Defense Forces Medical Corps, IDF, Ramat Gan; [10]Neurosurgery, Hadassah Medical Center, Hebrew University of Jerusalem, Jerusalem, Israel

Introduction: Traumatic brain injury (TBI) sustained in combat requires a different approach than civilian TBI. This study reports acute features, neurosurgical management, including use of intracranial pressure (ICP) monitoring and decompressive craniectomy (DC), among patients with war-related TBI (WrTBI).
Methodology: We established a 4-Hospital WrTBI Registry that is collecting common data elements (CDEs) on WrTBI in Israel. The current report includes consecutive WrTBI patients, with evidence of intracranial trauma on CT, admitted to one of the participating centers (Tel Aviv Sourasky Medical Center) between 7/10/2023-1/4/2024. Demographics, injury characteristics, neurosurgical interventions, and postoperative complications were recorded. Glasgow Outcome Scale-Extended (GOS-E) score at hospital discharge was estimated via chart review.
Results: Among 23 patients meeting inclusion criteria, 16 (70%) were male, median age was 32y (range 8-87y), 11 (48%) had GCS<9 on arrival (of whom 9 (39%) had GCS 3). 12 (52%) sustained penetrating TBI (pTBI) with foreign body on CT, 11 (48%) sustained frontal lobe injury, and 8 (35%) sustained temporal lobe injury. Overall, 13 patients (57%) underwent neurosurgical intervention: 6 (26%) wound debridement, 3 (13%) primary DC, 4 (17%) insertion of ICP monitor, 2 (9%) secondary DC due to intractable ICP. 4 (17%) had CNS infection during hospitalization; 3 (13%) had systemic infection. In-hospital mortality was 13% overall (27% among pTBI GCS8). Estimated discharge GOS-E was >4 in 74% (45% among pTBI GCS8). All patients that died during acute hospitalization had GCS 3 on arrival with at least 1 dilated non-reactive pupil.
Conclusions: The experience of our single center highlights the complexity of WrTBI, and the important role of ICP monitoring and DC in management of WrTBI. Data collection, entry, and pooling is ongoing from all four hospitals to allow more comprehensive results and comparative effectiveness studies.

Characterization of Intraoperative 5-ALA Fluorescence in Patients with Post-Radiation Brain Necrosis

Yevgeny Karepov[1], Segev Gabay[1], Rachel Grossman[2,3]
[1]Department of Neurosurgery, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel;
[2]Neurosurgery, Tel Aviv Sourasky Medical Center, Tel Aviv; [3]Department of Neurosurgery, Rambam Health Care Campus, Haifa, Israel

Introduction: Irradiation of the resected brain tumor, especially for malignant tumors, is common post-operative technique. In some patients, radiation of the resected area causes radiation necrosis (RN) in the surrounding brain tissue. The presence of 5-aminole-vulinic acid (5-ALA) intraoperative fluorescence is not exclusive to malignant tumors and can be found in other brain pathologies, such as inflammatory processes, gliotic tissue or after radiation.
The connection between RN and intraoperative fluorescence is not yet fully established in literature, those arose a need for better characterization of the factors that lead to 5-ALA fluorescence in RN.
Methods: This is a retrospective study. Demographics, clinical data, operative reports, and blood test results were collected for patients who were operated in Tel Aviv Medical Center, between 2011-2021, while the pathology was RN. Only patients who received preoperatively 5-ALA and had intraoperative fluorescence status in operative report were included.
Results: 35 patients were included in the study. 21 (60%) were female. Average age was 55.4 years (31-74 years range). 29 (83%) presented positive intraoperative fluorescence.
Patients with negative intraoperative fluorescence had significantly lower total radiation dose (24.8 Gy vs 48.1 Gy respectively, p=0.004), and significantly lower neutrophils to lymphocytes ratio (NLR) (3.5 vs 8.03 respectively, p=0.01).
Patients with metastases and negative intraoperative fluorescence were significantly younger (49 years vs 66.1 years respectively, p=0.04), and a tendency to lower: NLR (4.2 vs 6.1, respectively, p=0.27), total radiation dose (22.3 Gy vs 24.4 Gy respectively, p=0.27) and time from radiation (20 months vs 25 months respectively, p=0.33).
A histopathology of patients with negative intraoperative fluorescence presented less cellular tissue and fewer inflammatory cells, but not conclusively.
Summary and discussion: The main characteristics that led to absence of intraoperative fluorescence was a lower inflammatory response: younger age, lower NLR, less time from radiation and the lower total radiation dose.
Histopathology didn't unequivocally prove this fact. Some of negative intraoperative fluorescence may be contributed to the variation between patients' metabolism of 5-ALA and not necessarily to a lower inflammatory response.
We strongly recommend further studies with a larger and heterogeneous group of patients with specifically brain metastases patients.

Vagal Nerve Activity Predict Prognosis in Glioblastoma

Niv Katan[1], Nur Mansur[1], Yuri Gidron[2], Rachel Grossman[1]

[1]Department of Neurosurgery, Rambam Health Care Campus, Haifa; [2]Department of Nursing, Faculty of social Welfare and Sciences, University of Haifa, Haifa, Israel

Background: Less than 5% of patients with glioblastoma will survive five years after the diagnosis. Currently, extent of tumor resection is the only modifiable prognostic variable associated with overall survival. Over the past two decades, the role of the vagal nerve activity has been correlated with survival in various types of malignancies. The rationale for examining the prognostic role of this nerve in cancer is due to its inhibition of inflammation and sympathetic activity, both which otherwise promote tumors. The aim of this study was to investigate whether vagal nerve activity predicted survival in patients with glioblastoma among other well-known prognostic factors.

Methods: 89 patients with newly diagnosed glioblastoma who underwent biopsy or tumor resection in the neurosurgery department at Rambam medical center between 2013 and 2023 were included in this cohort. Their mean (SD) age was 60.1 (11.2) years. Vagal nerve activity was derived from 10sec ECGs. In the ECG, patients' heart-rate variability (HRV), reflecting changes in the intervals between normal heart-beats, was calculated. Survival was the major clinical outcome.

Results: During the study period, 67 patients (75.3%) had died. Older age significantly predicted overall survival and a lower Karnofsky Performance status (KPS) tended to predict survival as well. HRV, however, was not significantly correlated with survival. When splitting the sample at the HRV cut-off of Rout mean square of successive differences (RMSSD) > 27msec (previously linked to primary disease risk factors), we found that both KPS ($r = -.30$, $p < 0.05$) and EOR (-0.32, $p < 0.05$) significantly predicted death only when patients had low HRV, but not if patients had high HRV (for KPS: $r = -.07$, $p > 0.05$ and for EOR: $r = -0.13$, $p > 0.05$).

Conclusions: Our cohort found no significant correlation between HRV and survival among patients with newly diagnosed glioblastoma. However, high HRV emerged as a moderating variable: It moderated the adverse prognostic roles of poor performance status and EOR. Prospective clinical studies may shed light on the role of vagal nerve activation on prognosis among patients with glioblastoma.

Challenges and Strategies in Surgical Management of Meningiomas Involving Large Venous Sinuses a Local Experience

Ali Alkasim Kaadan, Jean Francois Soustiel
Neurosurgery, Galilee Medical center, Nahariya, Israel

Meningiomas involving large venous sinuses are a major dilemma for neurosurgeons in terms of surgical planning and the risk of venous infarction. We present our local experience dealing with several cases of complicated meningiomas involving the transverse, sigmoid, and superior sagittal sinuses from both anatomic walls of the sinus. The key role of elective DSA assessment of the venous drainage prior to surgery will be emphasized in each case.

The first case was a 39-year-old lady who presented with skull protrusion at her vertex with no obvious neurologic deficit at presentation. CT scan revealed bilateral parasagittal meningioma involving the middle third of the superior sagittal sinus (SSS). MRI/MRV showed complete occlusion of the middle third of the SSS, with two large veins suspected to be either draining the tumor or draining to the tumor running craniocaudally. DSA was done electively, showing collateral cortical veins anterior and posterior to the meningioma. The two large veins were shown as stump veins, or in other words, connection of these two veins to the meningioma was ruled out. Complete resection of the meningioma including the involved part of the SSS was performed with no complications, and the patient was discharged on the 4th day post-operation. CT POST OP showed no venous infarction.

The second and third cases are two similar cases presented after ambulatory investigation of headache. Head CT showed supra-infratentorial meningiomas involving the transverse sinus and transverse-sigmoid region. DSA was done and showed complete occlusion of the transverse sinus ipsilateral to the meningiomas. Complete resection of the meningioma including the involved part of the transverse sinus was performed with no complications, and the patients were discharged on the 4th day post-operation. CT POST OP showed no venous infarction.

Spontaneous Acute Subdural Hematoma, Case Series and Review of the Literature

Segev Gabay[1], Anatoly Budylev[2], Lior Gonen[1,3]

[1]Neurosurgery, Tel Aviv Medical Center, Tel Aviv, Israel; [2]Radiology, Tel Aviv Medical Center, Tel Aviv; [3]Tel Aviv Medical Center, Tel Aviv University, Tel Aviv, Israel

Objective: Acute subdural hematoma is primarily associated with traumatic brain injury. However, in rare cases, this condition may occur without a clear precipitating head injury and is therefore referred to as spontaneous acute subdural hematoma (sASDH). Our objective is to elucidate the presentation, management, and anticipated outcome of this condition.

Methods: All patients treated for ASDH in our center between January 2017 and May 2023 were retrospectively evaluated. The study included patients who met the following criteria: (1) Adult population; (2) Radiological scans indicating sASDH without any traumatic radiographic findings (3) No history of head injury within 6 months of the index admission. Data regarding demographics, presentation, radiological features, hospitalization course, and last follow-up were retrieved from electronic medical records. All relevant radiological scans were reviewed by an experienced neuroradiologist to confirm the radiographic diagnosis of acute (Vs acute on chronic) nontraumatic subdural hematoma.

Results: 310 patients were treated in our center for ASDH. Of them, 8 patients (2.5%) met the inclusion criteria and constituted our study cohort. Patients presented with acute headache (8\8, 100%), followed by seizures (3\8, 37.5%), dysphasia (1\8, 12.5%), and hemiparesis (1\8, 12.5%). All patients underwent radiological evaluation to identify any underlying pathology that may have caused the bleeding. In half (4/8) of the cases, the cause of the bleeding could not be determined; in the remaining 4 cases the etiology was identified as either tumor-related (1 meningioma, 1 hemangiopericytoma and 1 metastasis) or vascular (1 dural atriovenous fistula). Most patients (5/8, 62.5%) were surgically treated; of them, 3 patients underwent evacuation of the hematoma via urgent craniotomy and 2 via burr-holes several days after their admission. None of the 3 patients who were initially treated conservatively required a delayed surgical intervention. Perioperative mortality was 25% (2/8), both in patients who arrived in critical condition

Conclusions: sASDH is a rare but severe neurosurgical condition that carries significant risks and high mortality rate. Prompt diagnosis and timely intervention are therefore crucial for achieving favorable outcome in these cases. Since sASDH can often be associated with an underlying pathology, it is recommended to conduct thorough radiological investigation.

Thinking Out of the Box
Multifaceted Diagnosis and Management of Chronic Subdural Hemorrhage
Ali Alkasim Kaadan, Yoval Gruber
Neurosurgery, Galilee Medical Center, Nahariya, Israel

Chronic subdural hemorrhage is a common occurrence in neurosurgical practice. Routine cases can present challenges in diagnosis and treatment, especially if they come with an underlying disease. We present the case of a 48-year-old man with no prior medical history who experienced severe headaches several months after a minor head injury. A head CT scan revealed bilateral chronic subdural hematomas with mass effect. Initially, conservative management was attempted, but after 5 days, the patient returned with worsening symptoms and somnolence. A unilateral burr hole procedure without drains was performed, providing partial relief. However, symptoms recurred, prompting a redo Burr hole with subdural drain insertion, resulting in complete symptom resolution.

Five days later, the patient returned with dysarthria and vomiting, which partially improved after admission. A CT scan showed bilateral subdural hypodense collections with central herniation, raising suspicion of intracranial hypotension. MRI confirmed pachymeningeal thickening and cerebral sagging consistent with intracranial hypotension. Treatment included hydration, caffeine, and strict bed rest, leading to clinical improvement and discharge.

Despite initially rejecting an epidural blood patch, the patient presented a week later with somnolence and confusion, reporting clear nasal discharge. CSF rhinorrhea was suspected, but nasal examination and CT Cisternography yielded no conclusive findings. Conservative management was continued, and the patient was discharged.

Subsequent admissions for confusion and unstable gait led to further investigations, including MRI myelography and RISA Cisternography, which suggested spinal CSF leak, meanwhile multiple subdural drainages were performed, and ultimately, a subduro-peritoneal shunt was placed. Finally, spinal CT myelography led to localization of CSF leak at C7-D1 level. Initial lumbar blood patching yielded no improvement, but focal C-arm guided blood patching at the C7-D1 intervertebral foramen resulted in clinical improvement and discharge with no neurological deficits.

This case underscores the challenges in diagnosing and treating CSF leaks, necessitating a comprehensive approach for accurate diagnosis and effective management. Follow-up MRI six months later showed complete resolution of the subdural collections

How to Reduce Hydrocephalus Rate in Children with Posterior Fossa Tumor

Naama Turner[1], Liat Oren[2], Vladimir Shapira[1], Ravit Gabay-Yehezkely[1], Amalia Elkin[1], Mony Benifla[1]

[1]The Pediatric Neurosurgery Unit, [2]The pediatric Hemato-Oncology Department, Rambam Health Care Campus, Haifa, Israel

Objective: Posterior fossa tumor surgery in children carry a risk of approximately 30% for subsequent hydrocephalus. The Canadian preoperative prediction rule of hydrocephalus **(CPPRH)**, assigns scores to different factors in order to predict clinically significant hydrocephalus and to offer early CSF diversion surgery. Our study was performed to evaluate the validity of the CPPRH in predicting patients who are at risk to develop clinically significant hydrocephalus. In our institution we put an EVD for all patients with enlarged ventricles before tumor resection. In the post operation period we gradually elevate the level of the EVD while trying to "withdraw" the patient from the need of CSF diversion.

Methods: We retrospectively reviewed the medical charts of all pediatric patients with posterior fossa tumor treated at Rambam health-care campus, who underwent posterior fossa surgery between December 2017- April 2024. Statistical analyses were performed to identify significant factors related to the natural course of the disease and perioperative complications, and risk factors to develop them. Data of 72 patients was analyzed for age, gender, pathology, maximum tumor diameter, and the development of hydrocephalus requiring a definitive CSF diversion.

Patients with primary posterior fossa CNS tumors were included.

Results: Out of 72 patients, 15 passed away, while 57 continued with oncological and neurosurgical follow-up at our institution. 28% of our patients had benign pathologies, the remaining tumors varied in their degree of malignancy. Our surgical population appears to be similar in composition to the demographic data described in the literature. The percentage of patients requiring surgery for CSF diversion was 12.5%. Patients with germ cell tumors or ATRT have an increased risk of developing hydrocephalus (33% and 50%, respectively).

Discussion: The goal of our work is to reassess our approach to patient management and align treatment with the evolving personalized medicine paradigm. We found that slow elevation of the EVD level over 5-8 days may reduce the need of shunt insertion. To create a reliable assessment, further extensive research, including comparative and prospective studies, is essential.

Incidental Posterior-fossa Ependymoma in a Myelomeningocele Patient

Haggai Suisa, Sergey Abeshaus
Neurosurgery, Galilee Medical Center, Nahariya, Israel

Background: Ependymomas are uncommon tumors that arise from radial glial cells in the subventricular zone. A concurrent finding of an ependymoma in a patient with spinal dysraphism is rare and its management can be challenging.

Observations: We present a unique case of a posterior fossa ependymoma discovered incidentally during routine surveillance of a 16-month-old myelomeningocele (MMC) patient. The patient had undergone a craniotomy with gross total resection of the lesion followed by ventriculoperitoneal shunt insertion and proton beam therapy. Histopathological examination revealed a diagnosis of a WHO Grade 2 posterior fossa ependymoma. Routine MRI surveillance and neuro-oncology follow-up revealed no recurrence over three consecutive years.

Lessons: Our case report highlights the importance of routine surveillance imaging and multidisciplinary follow-up care for MMC patients, as early detection, complete surgical resection, and radiation therapy were key factors in achieving a positive outcome in this extremely rare coexistence of spinal dysraphism and cerebral malignancy.

Follow Up Brain US as an Alternative to CT Scan in Infants with Traumatic Intracranial Bleed

Naama Turner[1], Mika Shapira-Rootman[2], Anat Ilivitzky[2], Ayelet Eran[2], Amalia Elkin[1], Mony Benifla[1]

[1]The Pediatric Neurosurgery Unit, [2]Department of Radiology, Rambam Health Care Campus, Haifa, Israel

Objective: Head injury is the most a common traumatic cause for hospitalization in infants and toddlers under the age of two. CT scan is the imaging study of choice to diagnose intra cranial bleed, yet, it carries an associated radiation, especially in young children.

In our department, the follow up of children with small hematomas, as was diagnosed in the initial CT scan, is based on close clinical observation. To avoid follow up CT we perform trans-fontanelle brain US. In this report, we present our protocol, which has been proven effective and safe in monitoring infants up to the age of two with open fontanelle.

Methods: We retrospectively reviewed the charts of all infants aged 0 to 2 years who were admitted to our pediatric neurosurgical unit, with small intracranial hematoma, between January 2018 and March 2024. We analyzed their CT scan, the hospital course and brain US when performed.

Results: Out of the 316 infants admitted with abnormal CT scans, 77 children scheduled for a follow-up CT underwent a brain ultrasound instead. The male-to-female ratio was 1:1.5, with an average age of 7.5 months and an average hospital stay of 2.8 days. None of the patients had a significantly enlarged mass lesion nor needed surgery.

All 77 patients remained stable and did not require any further neurosurgical intervention or advanced imaging. All infants who were hospitalized were discharged home without any focal or other neurological deficits.

Discussion: Our departmental protocol, which combines close clinical follow-up and ultrasound imaging for evaluation, has proven to be an efficient and safe approach for monitoring children with intracranial hematoma and open fontanelle. This approach reduce the radiation exposure and associated risks for infants, and proved to be cost effective.

Flow Diverter with Surface Modification and Single Anti Platelet in the Management of Ruptured Intracranial Aneurysms - Multicentric Preliminary Experience

Marco Zurita[1], Ali Khanafer[2], Leah Kahanov[1], Alexander Sirakov[3], Hans Henkes[2], Jose E. Cohen[1]

[1]Neurosurgery, Hadassah Hebrew University Hospital, Jerusalem, Israel; [2]Neuroradiology Department, Klinikum Stuttgart, Stuttgart, Germany; [3]Radiology Department, UH St Ivan Rilski, Sofia, Bulgaria

This is a presentation of a multi-center experience in using hydrophilic polymer-coated (HPC) flow diverters (FDs) with single antiplatelet therapy (SAPT) to treat aneurysms in the acute setting of subarachnoid hemorrhage (SAH).

Methods: Patients treated for intracranial aneurysms within 30 days after SAH with a p64/p48 MW HPC FDs were identified.

Retrospective analysis of patients with aneurysmal SAH treated with FDS and SATP from 4/2017 to 4/2024.

Clinical presentation and outcomes, periprocedural and postprocedural complications, and degree of occlusion at follow-up were evaluated.

Results: A total of 89 patients were treated in 90 sessions (54.5% women; mean age 53.3 years). Four patients (4.9%) experienced FD-dependent complications. No cases of aneurysm rerupture or hemorrhagic complications related to antiplatelet therapy were recorded. Immediate complete occlusion was achieved in 28.3% of cases (24/88). The rate of complete occlusion among survivors was 83% in early follow-up (FU), 90.2% in mid-term FU, and 92.3% in the latest possible FU.

Conclusion: HPC FDs with SAPT are safe and effective in managing acutely ruptured aneurysms, with high occlusion rates at mid- and long-term follow-up, and a good safety profile. Adequate management of SAPT is crucial, particularly with higher doses than usual, to avoid both ischemic and hemorrhagic complications.

MRI-Guided Laser Interstitial Thermal Therapy for Treatment of Hypothalamic Hamartoma - TLVMC Experience

Lottem Bergman[1], Orna Aizenstein[2,3], Lilach Goldstein[3,4], Firas Fahoum[3,4], Anat Gauzman[5,6], Miryam Attias[5], Shimrit Uliel-Sibony[3,7], Jonathan Roth[3,5], Ido Strauss[3,5]
[1]Department of Neurosurgery, Tel Aviv Medical Center, Tel Aviv-Yafo; [2]Neuroradiology Unit, Department of Radiology, Tel Aviv Medical Center, Tel Aviv Yafo; [3]Tel Aviv School of Medicine, Tel Aviv University, Tel Aviv-Yafo; [4]Epilepsy Unit, Department of Neurology, Tel Aviv Medical Center, Tel Aviv-Yafo; [5]Functional Neurosurgery Unit, Department of Neurosurgery, Tel Aviv Medical Center, Tel Aviv-Yafo; [6]Department of Pediatric Neurosurgery, Dana Children's Hospital, Tel Aviv Medical Center, Tel Aviv-Yafo; [7]Epilepsy Unit, Dana Children's Hospital, Tel Aviv Medical Center, Tel Aviv-Yafo, Israel

Purpose: Hypothalamic hamartomas (HH) are rare developmental malformations within the brain, often causing drug-resistant epilepsy. MR-guided laser interstitial thermal therapy (MRgLITT) is a promising minimally invasive neurosurgical treatment option. This study retrospectively evaluates our initial experience with MRgLITT for HH treatment, focusing on lesion size, ablation accuracy, safety, and patient satisfaction.
Method: We reviewed clinical and imaging data of all patients who underwent MRgLITT for HH at the Tel Aviv Medical Center (TLVMC) between 2019 and 2023. Data collection included demographics, seizure characteristics, complications documented in medical records, and patient satisfaction assessed through phone interviews.
Results: Six patients underwent MRgLITT for intractable epilepsy due to HH. Four were children (average age at surgery: 12 ± 2.23 years) and two young adults (20 and 32 years old). The median follow-up period was 20 months (range 5-51 months). The average pre-op lesion volume was 0.3±0.32 cm^3. We were able to target all lesions using a single optic fiber. The average enhancing post ablation volume was 0.4±0.3 cm^3 There were no bleeding complications during the procedures. No serious adverse events or neurological deficits were reported during or after the procedure. Two patients experienced minor electrolyte disorders, one exhibited transient polyuria, and another presented with transient anisocoria that resolved spontaneously. Most patients were discharged on POD 1 (median 1 day, range 1-6 days).
3/6 patients of patients (50%) achieved seizure freedom (Engel class I), while the remaining 2/6 (50%) experienced a significant reduction in seizure frequency (Engel class II). All 6 patients and their families expressed high satisfaction with the procedure, willingness to repeat the treatment and would recommend it to others. Additionally, all patients are currently undergoing gradual tapering of their anti-seizure medications.
Conclusion: Our initial experience suggests that MRgLITT is a safe and effective minimally invasive treatment for HH in children and young adults. It demonstrates promising results in terms of ablation accuracy, seizure control, and patient satisfaction.

Long-Term Outcome of Mild Traumatic Brain Injury Among Young Adults

Aya Mudrik[1], Amit Azriel[1,2], Mai Ofri[1,3], Nave Paran[3], Elad Avraham[1,2], Yuval Sufaro[1,2], Israel Melamed[1,2]

[1]Faculty of Health Sciences, Ben Gurion University of the Negev, Beer-Sheva;
[2]Department of Neurosurgery, Soroka University Medical Center, Beer-Sheva; [3]Clinical Research Center, Soroka University Medical Center, Beer-Sheva, Israel

Background: Mild Traumatic Brain Injury (mTBI) is defined as a traumatic injury with a Glasgow coma scale (GCS) score of 13-15 at presentation. It is estimated that 100-300 per 100,000 people seek medical attention for mTBI annually worldwide. Symptoms of mTBI usually resolve within three months but might persist and compromise the quality of life of some affected patients. According to the current literature, younger adults might experience more psychosocial stress post-mTBI when compared to older adults.

Methods: We retrospectively reviewed the electronic medical records of young adults (aged 18-45 years) admitted to our emergency department (ED) between the years 2000-2020 and diagnosed with mTBI. Demographic, clinical, laboratory and neuroradiological data was retrieved and analyzed. Morbidity rates in the first year following the initial injury were analyzed.

Results: Total of 21,034 patients were included in this cohort, following exclusion of patients with insufficient medical records. Mean age was 24 years with 14,489 (69%) males. 351 patients (0.02%) had previous history of depression, PTSD or adjustment disorder. Following the ED visit, 3004 patients (14%) were admitted to the hospital for a median duration of 3 days. 1497 patients (7.1%) had an initial pathological CT scan. During the first year following their mTBI, 160 patients (0.007%) had a documented new psychiatric diagnosis – depression (61 patients), PTSD (27 patients) or adjustment disorder (72 patients). Significant risk factors for new psychiatric diagnosis were male gender, pathological CT scan or hospital admission following the ED visit. Interestingly, among pre-existing psychiatric conditions only prior adjustment disorder was identified as a risk factor for a new psychiatric diagnosis, whereas prior history of depression or PTSD was not considered a risk factor. Multivariate analysis of factors contributing to long-term outcomes will be presented.

Conclusions: Young and healthy adults might suffer long-term consequences of mild traumatic brain injury. Even though the general incidence is relatively low, risk factors for new psychiatric diagnoses following mTBI should be recognized. Health care providers may consider launching dedicated surveillance and interference programs for the relevant patients.

Stereotactic Radiosurgery for Brain Metastases Arising from Gynecological Malignancies

Philip Blumenfeld[1], Yoni Shopen[1], Marc Wygoda[1], Aron Popovtzer[1], Tal Falick Michaeli[1], Yigal Shoshan[2]

[1]Radiation Oncology, Hadassah Medical Center, Jerusalem; [2]Neurosurgery, Hadassah Medical Center, Jerusalem, Israel

Background: This retrospective study aims to assess the efficacy of stereotactic radiosurgery (SRS) in the treatment of brain metastases (BM) originating from gynecological cancers. It focuses on local control (LC), distant tumor control (DTC), and overall survival (OS).

Methods: The analysis comprised 18 individuals with gynecological-origin BM treated with SRS at the Hadassah Medical Center from 2004 to 2021. Statistical analyses evaluate factors impacting LC, DTC, and OS.

Results: A total of 36 BM of gynecological origin underwent SRS. The median age at the first SRS treatment was 60 years, with a median time of 24.5 months from the primary malignancy diagnosis to BM detection. The 12-month LC rate per patient was 84.6 %, and 5.6 % per BM. Only two instances of local recurrence were observed. The DTC at 12 months was 75 %, with a 29 % overall. Non-significant trends indicating a correlation with distant brain failure with increased cumulative volume and the occurrence of craniotomy before SRS. The median OS of the cohort was 16.5 months from SRS treatment. The 6, 12, 18, and 24-month survival rates were 77.8 %, 66.7 %, 50 %, and 22.2 % respectively. Higher number of BM was associated with lower OS (p = 0.046). On multivariate analysis, age was a significant factor for OS (p = 0.03), demonstrating that older age was associated with a more favorable prognosis.

Conclusion: This study supports SRS effectiveness for treating BM from gynecological cancers and suggests similar outcomes to more common malignancies.

Favorable Patients' Outcomes Following Stereotactic Radiosurgery and Surgical Intervention for Brain Metastases of the Motor Cortex

Diana C. Bolivar V.[1], **Jose A. Asprilla Gonzalez[1]**, Guy Dumanis[1], Paz Kelmer[1], Shachar Shemes[1], Zvi R. Cohen[1], Zion Zibly[1], Anton Wohl[1], Uzi Nissim[1], Roberto Spigelmann[1], Alisa Talianski[2], Yaacov R. Lawrence[3], Amos Stemmer[4], Ory Haisraely[2,3], Tehila Kaisman-Elbaz[1]

[1]Neurosurgery, Sheba Medical Center, Ramat Gan; [2]Neuro-Oncology Unit, Sheba Medical Center, Ramat Gan; [3]The Department of Radiotherapy, Sheba Medical Center, Ramat Gan; [4]The Department of Oncology, Sheba Medical Center, Ramat Gan, Israel

Background: Patients' outcomes following treatment for motor cortex brain metastases (BMs) are inconclusive, as most cohorts include symptomatic as well as asymptomatic patients, various sized lesions, treated with either stereotactic radiosurgery (SRS) or surgical resection.

Methods: Here, we studied the data of 70 patients, treated with SRS, combined either with or without surgery at Sheba Medical Center from 2010 to 2022. Patients were diagnosed with BMs located within or adjacent to the motor cortex and presented accordingly with hemiparesis or hemiplegia. Patients' demographics, clinical and oncological outcomes, SRS, surgical treatment paradigms, and their associated outcomes, were retrieved.

Results: Patients' mean age-at-diagnosis was 65 years (SD = 11.72), and the median follow-up duration from BMs diagnosis was 9 months (95% CI [6.9, 12.7]). Patients were treated with SRS alone (n = 38), or SRS combined with tumor resection or Ommaya reservoir insertion (n = 32). The entire cohort's median OS from BMs diagnosis (OS-BMD) was 9.7 months (95% CI [7.2, 14.7]). The median OS-BMD of patients treated with SRS and surgery was 15.1 months (95% CI [12.5, 25.1]) while patients treated with SRS alone demonstrated OS-BMD of 6.7 months (95% CI [4.9, 9.7]), p = 0.001. In a multivariate Cox proportional-hazards analysis, patients treated with SRS combined with surgery had a 67% decreased mortality risk (HR = 0.33, 95% CI [0.18, 0.62]; p = 0.001). Forty-one percent (n = 29) of the patients demonstrated motor deficit improvement and had favorable OS-BMD, showing a 54% reduction in mortality risk (HR = 0.46, 95% CI [0.25, 0.84]; p = 0.012), and neither of the treatment modality was superior in achieving motor function improvement. The median tumor volume treated was 3.38 cc [IQR = 5.76] and showed a 4% increase in mortality risk for each 1 cc of BMs volume (HR = 1.04, 95% CI [1, 1.09]; p = 0.045).

Conclusion: This study comprehensively explores the clinical and oncological outcomes of a homogenous cohort of symptomatic motor cortex BMs patients. A favorable OS-BMD and reduced mortality risk were demonstrated for patients treated with SRS and surgery and for patients who exhibited motor function improvement.

The Effects of Congenital Cervical Spinal Stenosis on the Incidence and Severity of Degenerative Cervical Myelopathy

Leah Morejon, Uri Hadelsberg, Andres Vargas, Jonathan Segal
Neurosurgery, Hadassah Ein Kerem, Jerusalem, Israel

Background: Degenerative Cervical Myelopathy (DCM) is a common cause of spinal cord disease in older population that results in progressive cervical spinal cord compression with future neurological impairment. One of the suggested risk factors is congenital cervical spinal stenosis (CCSS) as seen in syndromic patients; however, our research included non-syndromic patients with CCSS.
Our objective is to demonstrate an association between patients with congenital cervical spine stenosis and the presence of a more severe form of DCM.
Method: This is an observational, retrospective study with data obtained from a single institution between 2004-2018. Two groups were stablished: CCSS patients with a mean spinal canal diameter of <12mm and normal diameter cervical spine (NDCS) with ³ 12mm.
We analyzed: extent of spinal stenosis on MRI by determining the number of spinal levels affected; severity of the disease by identifying MRI T2 cord signal change (T2CSC); finally, we compared demographic information.
Results: Patients that underwent elective surgery for cervical spinal were included: CCSS 64, NDCS 123, total 187. Average age: CCSS 53.09 and NDCS 52.72. The demographics of each group was not statistically significant (p=0.832).
In CCSS group, 43.75% (28/64) had T2CSC compared to 19.5% (24/123) NDCS group; this was statistically significant (p<0.001).
Regarding extent of cervical disease: CCSS group 53.12% (34/64) suffered from a diffuse disease compared to 25.2% (31/123) NDCS group; this had statistical significance (p=0.007).
The CCSS group had a smaller mean spinal cord diameter (mean- 6.75mm) as well as a higher percentage of patients with a more diffuse spinal column disease than the NDCS group (mean 7.19mm) with statistical significance (p<0.001).
Conclusions: Patients with CCSS have significant diffuse cervical canal stenosis with severe cord compression (3 or more levels) resulting in heightened myelopathy than the ordinary population; this is especially seen in older males. Our results could aid in choosing an extensive, more encompassing form of surgical treatment (i.e. multiple laminectomies and corpectomies); however, further studies are needed to stablish a well-rounded surgical approach for these patients.

Hydrocephalus Management Protocol for Children with Posterior Fossa Tumors. A Pilot Single-Center Study

Miki Klaiman, Noa Schwartz, Amir Kershenovich, Ido Ben Zvi
Neurosurgery, Schneider Children's Medical Center of Israel, Petah Tikva, Israel

Objective: Posterior fossa tumors in children have hydrocephalus rates of up to 30%. It has also been established that for malignant tumors, a timely adjuvant treatment (under one month) has important prognostic implications. As we previously published, the management of hydrocephalus may cause preventable delays in administration of adjuvant treatment. To prevent this delay, we established a pre and postoperative protocol for the management of hydrocephalus.
Methods: In this pilot descriptive single-center, retrospective study, we present our first eight cases managed by the protocol which includes among others the use of the modified Canadian preoperative predictive rule for hydrocephalus (MCPPRH), a preoperative decision-making algorithm for the use of both endoscopic third ventriculostomy (ETV) and external ventricular drain (EVD), and a postoperative 10-day decision-making algorithm for EVD weaning and ventriculoperitoneal shunt (VPS) insertion. Pediatric posterior-fossa tumor cases that were operated on in our department since the implementation of the protocol were included. Data was retrieved from the electronic hospital database.
Results: Four malignant tumors were diagnosed, three pilocytic astrocytoma, and one hemangioblastoma. One VPS in total (14%) was inserted, 3 ETVs (one of them was shunted-all malignant tumors). MCPPRH was above 5 in two cases, one received a VPS. All cases apart from one received EVDs, in all cases it was removed within 10 days. In one case as presented, it was converted to a VPS. Adjuvant treatment was administered in four cases. In all apart from one, treatment was given in less than a month from diagnosis. One case was delayed due to non-neurosurgical reasons.
Conclusions: our strict 10-day protocol can enable the prevention of hydrocephalus-related delays in adjuvant treatment. There was a 14% VPS rate, possibly due to preoperative ETV use. We invite the participants of the conference to apply the protocol in order to establish a larger multinational database for its validation.

Early Surgical Intervention in Non-Functioning Pituitary Macroadenomas in Adult Patients without Optic Apparatus Compression, Should We Consider It. A Matched Case-Control Study

Yuval Sufaro[1,2], Elad Avraham[1,2], **Moshe Shmueli[1]**, Nave Paran[3], Talya Blumkine[2], Israel Melamed[4], Merav Frenkel[2,5], Amit Azriel[2,6]

[1]Department of Neurosurgery, Soroka University Medical Center, Beer Sheva; [2]Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer Sheva; [3]Clinical Research Center, Soroka University Medical Center, Beer Sheva; [4]Clinical research center, Soroka University Medical Center, Beer Sheva; [5]Department of Endocrinology, Soroka University Medical Center, Beer Sheva; [6]Department of Neurosurgery, Ben-Gurion University of the Negev, Beer Sheva, Israel

Background: Surgical decompression is the recommended treatment for patients with non-functioning pituitary macroadenomas (NFPMAs) with associated visual impairment. Other relative indications for surgery include endocrinopathies, craniopathies, and headaches. Nevertheless, patients without those 'classical indications' who would otherwise be considered asymptomatic with regards to the NFPMAs, and treated conservatively with clinical radiological surveillance, may suffer higher rates of other morbidities related to the NFPMAs. We aimed to evaluate the prevalence of newly diagnosed comorbidities in conservatively treated patients with NFPMAs.

Methods: We reviewed the medical records of 55 patients with NFPMAs from 2012-2022 who lacked classical indications for surgery at diagnosis. During the follow-up period we searched for any of the following potentially associated newly reported symptoms and signs: headache, dizziness, syncope, GI symptoms, hyponatremia, falls, weakness and general deterioration, CVA related, and endocrine-related including DM-2. Patients were compared to a matched control group. Cohort patients were further analyzed to discover specific endocrine axes deficiencies, and tumor volumes were measured using MRI scans at diagnosis.

Results: 55 patients were included in the final cohort. NFPMAs were associated with the development of newly diagnosed headaches, hypertension and Hypopituitarism. Other symptoms associated with NFPMAs included – dizziness, syncope/pre-syncope, GI-related symptoms, hyponatremia, general weakness and falls, infectious-related symptoms. Average associated ER visits in this group were higher compared to the control group.

Conclusions: These results may suggest the advantages of early surgical intervention for NFPMAs to mitigate comorbidities and improve health-related quality of life.

Latest News from 10 Years of MRgFUS

Lior Lev-Tov[1,2,3], Alon Sinai[1], Noam Shalem[3], Maria Nassar[4], Inna Senderova[4], Ayelet Eran[5], Ilana Schlesinger[4,2]

[1]Neurosurgery, Rambam, Haifa, Israel; [2]Faculty of Medicine, Technion, Haifa; [3]Faculty of Biomedical Engineering, Technion, Haifa; [4]Neurology, Rambam, Haifa, Israel; [5]Radiology, Rambam, Haifa, Israel

Background: MR Guided Focused Ultrasound (MRgFUS) was introduced for intracranial ablation in 2011. Since then, the platform has emerged worldwide with FDA clearance for treating Essential Tremor (ET) bilaterally and Parkinson's Disease (PD). About 15,000 ablative procedures around the globe gained much experience, which influences real-world clinical. Rambam has been running MRgFUS practice since 2013 with about 240 procedures and is the first site in the world to explore and fully clinically treat with MRgFUS's new generation: The Exablate Prime. The MRgFUS practice has dramatically changed ten years back- from patient selection, technical approach, system capabilities, ablative targets, patient and surgeon interface, and treatment outcomes.

Aim: to highlight the insights from Rambam and worldwide MRgFUS experience and their influence on daily practice, which enable expanded indications for treatments and improve clinical outcomes.

Methods: Analyze clinical data from the past ten years at Rambam and integrate insights from leading papers and case reports worldwide.

Results: Rambam has presented outstanding tremor control with a mild side effects profile in almost 240 treatments. However, based on the experience gained, clinical practice has changed significantly. Furthermore, the MRgFUS new generation has significant technical and firmware improvements that were integrated into the clinical practice.

Conclusion: Integrating gained experience with technological improvements can dramatically enhance clinical practice, expand treatment indications, and improve patient experience, treatment safety, and outcomes.

Embolization vs Stereotactic Radiosurgery for Arteriovenous Malformations in Children. A Comparative Trial Between Two Large Referral Centers

Yuval Rimoni[1], Gregory James[2], Noa Schwartz[1], Fergus Robertson[3], Adam Rennie[3], Eliahu Perlow[4], Dulanka Silva[2], Amir Kershenovich[1], Ido Ben Zvi[1]

[1]Neurosurgery, Schneider Children's Medical Center of Israel, Petah Tikva, Israel; [2]Neurosurgery, Great Ormond St Hospital, London, UK; [3]Interventional Neuroradiology, Great Ormond St Hospital, London, UK; [4]Interventional Neuroradiology, Schneider Children's Medical Center of Israel, Petah Tikva, Israel

Objective: Brain arteriovenous malformations (AVM) in children constitute the primary cause of spontaneous hemorrhages. Given the accumulated lifetime risk for haemorrhage in this age-group, most centers recommend treatment at diagnosis. Traditionally AVMs were treated with embolization and/or microsurgery, with stereotactic radiosurgery (SRS) reserved for inoperable or failed embolization/surgery cases. In recent years there has been a paradigm shift towards earlier use of SRS. We aimed to examine two centers which hold these two approaches, comparing cure and bleeding rates among others, to assess the efficacy of these approaches.

Methods: A retrospective analysis of prospectively maintained databases of two pediatric neurosurgery referral centers. Center A's approach supports embolization either with a curative intent or as preparation for surgery, with SRS seldomly performed. Center B embolizes only high-risk features (aneurysms) and as preparation for surgery. If surgery is not considered, then SRS will be considered. For both centers, a multimodal approach is executed when appropriate. Pediatric patients with brain AVM diagnoses were included. Untreated patients and those with insufficient data were excluded.

Results: Across the two centers 107 patients were evaluated with a mean of 26.6 months' follow-up. In center A there were significantly less hemorrhages at presentation compared to center B, although center A had significantly more aneurysms on angiography. Center A performed 10.8% SRS compared to 67.8% in center B. In terms of cure, 47% of the patients in center A achieved cure compared to 62.5% of center B. Rebleed rates were lower in center B-7% compared to 16%.

Conclusions: When comparing these two approaches, SRS as a primary choice for non-surgical patients or as an adjunct to surgery seems to be safe and efficacious, with the downside of a slower curative process (4-5 years follow-up). Embolization correlated with double the rebleed rates compared to SRS, possibly due to changes in flow velocity.

Electrophysiology of the Subthalamic Nucleus. Parkinson's Disease vs Essential Tremor

Halen Baker Erdman[1], Juan Leon[2], Glowinsky Stefanie[1], Heyman Sammy[2], Bergman Hagai[1,2], **Zvi Israel[2]**

[1]Medical Neurobiology, HUJI, Jerusalem; [2]Neurosurgery, Hadassah Medical Organization, Jerusalem, Israel

Background: Essential Tremor (ET) is a prevalent movement disorder, impacting around 5% of the global population. While pharmacological treatments benefit many ET patients, those with severe and unresponsive symptoms often require surgical intervention, such as ablation or deep brain stimulation (DBS). Using an innovative dual electrode technique to target the posterior subthalamic area (PSA) using the adjacent subthalamic nucleus (STN) as a navigational reference, this study investigates the undiscovered electrophysiology of the STN in ET patients compared to that of Parkinson's disease (PD) patients.

Methods: Simultaneously inserting two recording electrodes into the brain, one in the anterior lateral BenGun location targeting the STN and the other in the central BenGun location targeting the PSA, we leverage the distinct STN characteristics of increased background noise and high-density firing, as measured by root mean square (RMS), to identify the entrance and exit points of the STN in ET patients. The STN of PD patients was either targeted using one electrode in the central BenGun location or two electrodes with one in the central and one in the posterior BenGun location. Spectral analysis and analysis of the RMS were then performed on the electrophysiological data gathered from ET patients' STN (n=21 patients, 31 trajectories) with that of Parkinson's disease (PD) patients (n=35 patients, 62 trajectories).

Results: We successfully target the PSA by utilizing the electrophysiological signature of the STN as a reference. The STN of ET patients exhibited distinct frequency distribution changes compared to PD patients' STN. Additionally, the average RMS of the ET patients' STN was lower than that of the PD patients.

Conclusion: The STN of ET patients shows a unique electrophysiological pattern compared to PD patients despite the overlap in some motor symptoms of the diseases. These findings should be further explored to elucidate the underlying mechanisms of ET which are currently still debated.

Personalized Tremor Control Targeting for MRgFUS Using Tractography

Noam Shalem[1,2,3], Alon Sinai[1], Gil Zur[4,5], Gal Carmely[3], Haim Azhari[3], Ayelet Eran[4], Ilana Schlesinger[2], Lior Lev-Tov[1,3,5]

[1]Neurosurgery, Rambam Health Care Campus, Haifa; [2]Neurology, Rambam Health Care Campus, Haifa, Israel; [3]Faculty of Biomedical Engineering, Technion - IIT, Haifa; [4]Radiology, Rambam Health Care Campus, Haifa; [5]Faculty of Medicine, Technion - IIT, Haifa, Israel

Background: Tremor is a highly disabling symptom common in both Essential Tremor (ET) and Parkinson's disease (PD), conjugate with the dramatic reduction in quality of life. Magnetic Resonance guided Focused Ultrasound Surgery (MRgFUS) is a well-established non-invasive technology that utilizes sound wave energy to induce a focal thermal lesion with sub-millimeter precision to treat patients with tremor. The ventral intermediate nucleus of the thalamus (VIM) is a well-studied target for tremor reduction. However, since the VIM can't be visualized radiologically, different targeting methods were developed. Indirect targeting is the most common approach for VIM targeting based on patients' anatomy using the anterior-posterior commissure (AC-PC) as a landmark. However, it correlates with suboptimal tremor control up to 20%, with inconsistency of the treatment's outcome, such as long-term tremor control and side effects. Moreover, inaccurate targeting causes a longer procedure with an excessive amount of sonications affecting the treatment's outcome.

Aim: Utilization of advanced imaging analysis methods as a targeting approach for personalized treatment and superior clinical outcomes.

Methods: Pre- and postoperative MRI scans were acquired from 81 patients who underwent MRgFUS. Using the preoperative diffusion tensor imaging (DTI) MRI sequence, three tracts (pyramidal tract [PT], medial lemniscus [ML], and dentatorubrothalamic tract [DRT]) were located for each patient using tractography. Day one postoperative T1 weighted images were used for lesion evaluation while geometrical measurements were performed, such as volume, 3-D location, the distance and overlap between the lesion and each tract. Statistical tools were applied to find correlations between the postoperative clinical evaluations (up to 2 years) and the image analysis.

Results: A specific region of the DRT was correlated with superior outcome, and personalized optimal targeting coordinates were determined based on these results.

Conclusion: The treatment's target can be defined according to the correlations discovered. We suggest an innovative personalized method to detect the target for treating tremor using MRgFUS. This technique tailors the target localization to a specific patient based on the patient's functional anatomy—the spatial locations of the patient's tracts.

Common Data Elements in War-Related Penetrating Traumatic Brain Injuries

Saadit Houri[1], Raquel Gardner[2], Anton Peled[3], Avital Perry[3], Elad Avraham[4], Yevgeny Karepov[5], Mohamad Hmaeed Asdi[5], Israel Melamed[4], Leah Morichon[1], Rotem Hershkovitz[1], **Guy Rosenthal[1]**

[1]Department of Neurosurgery, Hadassah-Hebrew University Medical Center, Jerusalem; [2]Joseph Sagol Neuroscience Center, Sheba Medical Center, Ramat Gan; [3]Department of Neurosurgery, Sheba Medical Center, Ramat Gan; [4]Department of Neurosurgery, Soroka Medical Center, Beer Sheva; [5]Department of Neurosurgery, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel

Introduction: Treatment strategies for penetrating traumatic brain injuries (pTBI) often advance during military conflicts. Improved evidence-based guidelines for treating these complex injuries are needed. A major barrier in synthesizing evidence is the lack of standardized reporting between studies of pTBI. We sought: (1) to develop a set of common data elements (CDEs) to standardize reporting of key elements in presentation, clinical course, treatment, and outcomes of pTBI, and (2) to assess feasibility of pTBI CDE data-collection during an active conflict.

Methodology: We developed modular forms and an accompanying REDCap database to support a 4-Hospital War-Related TBI Registry whose primary goal was to support clinical decision making and quality improvement. Essential elements from the newly-revised pTBI Guidelines (e.g., CT features, surgical interventions, ICU course) are coded to monitor guideline adherence and ascertain therapeutic intensity as designated by the SIBICC algorithm for treatment of elevated ICP. Outcome assessment with Glasgow Outcome Scale-Extended (GOS-E) is planned for 6 months and 1-year post-injury.

Results: From October, 7, 2023 – March 31, 2024, 82 patients were registered across the 4 participating centers. All centers have received training and initiated internal registry data collection. All centers were able to capture data from the ED, surgery, and ICU phases of the hospital course. Barriers to timely data collection and data entry are provider time needed to complete the forms. A set of abbreviated registry forms are now being developed to facilitate more timely form completion and data entry.

Conclusions: The use of pTBI CDEs is feasible in a real-world setting during military conflict and may provide a standardized method of reporting that will help in the development of future evidence-based guidelines. CDEs may provide a tool to facilitate assessments of adherence to guideline recommendations and serve as a basis for comparative effectiveness research in pTBI treatment.

The New Guidelines for Penetrating Traumatic Brain Injuries - A Preview

Guy Rosenthal
Department of Neurosurgery, Hadassah-Hebrew University Medical Center, Jerusalem, Israel

Introduction: The basic principles of treatment of penetrating traumatic brain injuries (pTBI) have advanced during military conflicts. The need to formulate evidence-based guidelines for treating these complex injuries has become evident. The Brain Trauma Foundation with the support of the US Department of Defense undertook a project to update the pTBI Guidelines via a systematic review of the pTBI literature and an in-person Consensus Conference to formulate treatment recommendations.

Methodology: A systematic review of key topics in pTBI evaluation and treatment was performed by an international group together of 35 clinicians together with experts in evidence-based medicine (EBM) from Oregon Health Sciences University. Participants included neurosurgeons with expertise in pTBI (one-third military neurosurgeons), together with experts in neurocritical care, trauma surgery, anesthesiology, and emergency medicine. Standard EBM criteria were used to rate evidence and classify recommendations. When recommendations could not be made by EBM standards a Delphi method using expert consensus with 80% threshold was used to make consensus-based recommendations.

Results: pTBI Guideline recommendations were made for pre-hospital, ED, operating theater, ICU, and endovascular aspects of treatment. Specific topics addressed include: local debridement versus decompressive craniectomy, timing of surgery, prevention of CSF leak, ICP and CPP thresholds, seizure prophylaxis, antibiotic prophylaxis, DVT prophylaxis, screening for vascular injuries, timing of angiography, and need for repeat vascular imaging. Treatment algorithms and futility assessments are also included in the Guidelines. A key conclusion is the imperative to avoid nihilism in pTBI patients since survivors can attain good functional outcomes.

Conclusions: The upcoming revised pTBI Guidelines provide a structured framework for helping to guide care and standardize treatment. Educational efforts will be critical for Guideline dissemination and compliance. It is hoped that adherence to Guidelines will help improve patient outcomes.

Near Infrared Optical Molecular Imaging in Neurosurgery. Moving Towards Clinical Translation with a Novel Nerve-Specific Binding Phenoxazine-Based Fluorophore

Amir Kershenovich[1], Connor W Barth[2], Lei G Wang[2,3], Summer L Gibbs[3,2]

[1]Pediatric Neurosurgery, Schneider Children's Medical Center of Israel, Petah Tikva, Israel; [2]Trace Biosciences, Portland, Oregon, USA; [3]Biomedical Engineering, Oregon Health and Science University, Portland, Oregon, USA

Introduction: Nerve damage following nerve-sparing surgeries continue to concern neurosurgeons, who still rely heavily on anatomical knowledge and white light visualization for intraoperative guidance.

Optical molecular imaging (OMI) utilizes fluorescent dyes to label target areas, enabling real-time color contrast during surgical procedures.

Almost all clinical fluorescence-guided surgery (FGS) systems, like surgical microscopies and laparoscopes, have an “800 nm” Near-infrared (NIR) channel designed to image Indocyanine green (ICG). NIR light has an electromagnetic wave with a wavelength ranging from 700 nm to 2500 nm.

ICG and methylene blue (MB) are among the only NIR fluorophores (a fluorescent chemical compound that can re-emit light upon light excitation) approved by the US Food and Drug Administration (FDA).

To date, no clinically approved nerve-specific fluorophore with an emission profile appreciably compatible with current NIR FGS systems exists.

We present here the results of the first neurosurgery on a large animal, using a first-in-class NIR nerve-binding fluorophore compatible with the 800 nm imaging channel.

Methods: An Institutional and federal Helskinky permit emitted by Israel’s Ministry of Health was obtained to experiment on a 20 kg, 3 month old pig using the fluorophore in matter.

Results: An occipital and suboccipital craniectomy and upper cervical laminectomies were performed. The duramater was opened, exposing the cerebellum, lower cranial nerves and cervical spinal cord and nerves. The fluorophore was spread over the exposed areas and NIR images and videos were taken at 5 minutes and up to 1 hr. after administration using a Zeiss Kinevo 900 micro and exoscope, confirming the nerve specificity binding of the fluorophore.

Conclusions: The Nerve-Specific binging fluorophore was effective in showing myelin containing structures.

Decision-Making in War-Related Severe Penetrating Cranio-Cerebral Injury

Elad Avraham[1], Amit Azriel[1], Micky Gidon[1], Vladimir Merkin[1], Yuval Sufaro[1], **Farouq Alguayn[1]**, Rashad Naamna[1], Antonio Houry[1], Subhi Abu Zaid[1], Alexander Zlotnik[2], Moti Klein[2], Michael Dubilet[2], Evgeny Brotfein[2], Amit Frenkel[2], Ohad Gabay[2], Leonid Koifman[2], Ron Gal[2], Ruslan Kurtz[2], Yaniv Almog[3], Lior Fuks[3], Ori Galante[3], Slutsky Tzachi[4], Dan Schwartzfox[4]

[1]Neurosurgery, Soroka University Medical Center, Beer Sheva; [2]Anesthesiology and GIC Division, Soroka University Medical Center, Beer Sheva; [3]Internal Medicine ICU, Soroka University Medical Center, Beer Sheva; [4]Emergency Medicine, Soroka University Medical Center, Beer Sheva, Israel

Severe craniocerebral injuries caused by war can have devastating effects on both patients and their loved ones. Unfortunately, this group of patients has been largely overlooked in medical literature, leaving medical teams uncertain about natural history and treatment effectiveness and safety, with subsequent highly difficult decision-making, particularly regarding surgical-related decisions.

The lack of a specific algorithm for treating such patients means that decisions are often guided by emotions and the surgeon's desire to give the maximal possible treatment, even at the cost of a slim chance of an acceptable outcome.

This research addresses this knowledge gap by analyzing the treatment results of a cohort of 28 patients who have suffered from injuries in our institute. By doing so, we hope this research will help reduce uncertainty and improve care and outcomes for this patient population. Moreover, we hope it will help draw greater attention to interdisciplinary collaborations across the traditional boundaries of medicine, philosophy, and sociology.

Laser Interstitial Thermal Therapy for Pediatric Low-Grade Glioma, Case Presentations and Lessons Learned

Ido Strauss, **Segev Gabay**, Roth Jonathan
Neurosurgery, Tel Aviv Medical Center, Tel Aviv, Israel

Background: The surgical treatment of brain tumors has developed over time, offering customized strategies for patients and their specific lesions. One of the most recent advances in pediatric neuro-oncological surgery is laser interstitial thermal therapy (LITT). However, its effectiveness and indications are still being evaluated. The aim of this work is to review the current literature on LITT for pediatric low-grade gliomas (pLGG) and evaluate our initial results in this context.
Methods: We retrospectively reviewed our pediatric neurosurgery database for patients who received LITT treatment between November 2019 and December 2023. We collected data on the indications for LITT, technical issues during the procedure, and clinical and radiological follow-up.
Results: Three patients underwent 5 LITT procedures for pLGG. The lesion was thalamo-peduncular in one patient, cingulate in one, and deep parietal in one patient. Two patients had a previous open resection done and were diagnosed with pLGG. One patient underwent a stereotaxic biopsy during the LITT procedure that was non-diagnostic. The same patient underwent a later open resection of the tumor in the cingulate gyrus. There were no surgical complications and all patients were discharged home on the first post-operative day. The follow-up period was between 20 and 40 months. Radiological follow-up showed a progressive reduction of the tumor in patients with LGG.
Conclusion: Laser interstitial thermal therapy is a minimally invasive treatment that shows promise in treating deep-seated pLGG in children. The treatment has demonstrated a reduction in tumor volume and the positive results continue over time. LITT can be used as an alternative treatment for tumors located in areas that are difficult to access surgically or in cases where other standard treatment options have failed.

Central Intracranial Epidermoid Cyst Resection Through the Infratranstentorial Subtemporal Approach - A Case Series of 15 Patients

Waed Masalha, Sergey Spector, Andrew Kaye, Jose Cohen, Samuel Moscovici
Neurosurgery, Hadassah medical center, Israel, Israel

Objective: Centrally located epidermoid tumor are challenging intracranial masses to approach. The authors want to share their experience tackled those complex tumors, using the infratranstentorial subtemporal approach.
Methods: Prospective data was supplemented with retrospective review of records for consecutive patients operated from 2000 to 2022 for resection of centrally located skull base intracranial epidermoid tumors, using the ITSTA approach. Data was collected relating to clinical presentation, imaging findings, including number of invaded cisterns, extent of resection graded as GTR (total resection including capsule), NTR (cyst capsule was left behind), STR (>90% resection), and PR (<90%), postoperative complications and long-term outcomes.
Results: There were 15 patients operated using the ITSTA during the study period. 10 (66.6%) were female and 5 (33.3%) males. Mean age at surgery was 41 + 2 years. Headache was the most common clinical presentation in 6 (40%) of patients. Mean number of invaded cisterns was 10 (SD + 0.5). mean tumor volume 39 cc +-1. GTR was achieved in 2 (13.3%), NTR in 1 (6.6%), STR in 8 (53.3%) and PR in 4 (26.6%), one patient was lost from follow up. In the follow up period, of 10 + 2 years, there were 11 recurrences. During the study period, there were 3 patients that needed reoperation to manage recurrence. There was no perioperative mortality. Complications were seen in 8 (53.3%) patients. In 2 patients CSF derivation was needed. Aseptic meningitis in 1 (6.6%) of cases.
Conclusion: Central epidermoid tumor location is a challenging lesion to treat. The ITSTA is a valuable approach to tackle those lesions with and high EOR, long PFS and IFS, and low morbidity risk.

Acute Spontaneous Spinal Subdural Hematoma - A Case Report

Wassim Mazarieb[1], **David Shaked Zari[2,1],** Shadi Hayek[1], Gill E. Sviri[1]
[1]Neurosurgery, Rambam Medical Center, Haifa; [2]The Ruth and Bruce Rappaport Faculty of Medicine, Technion Israel Institute of Technology, Haifa, Israel

Spontaneous spinal subdural hematoma is a rare neurosurgical emergency that can result in severe neurological deficits. This condition is typically precipitated by factors such as coagulation abnormalities, trauma, underlying neoplasms, or arteriovenous malformations. Bleeding usually originates from venous sources, and symptoms may progress over several days. Timely intervention is critical, particularly in neurologically unstable patients. Treatment typically involves laminectomy and evacuation of the hematoma to relieve compression and prevent permanent neurological damage. Stable neurological deficits often have a favorable prognosis and can be managed conservatively.

In this case report, we present the case of a 34-year-old healthy female who initially presented with unspecified back pain for two weeks, followed by rapid deterioration manifested as paraplegia. The exacerbation occurred within 12 hours, resulting in spastic paraplegia in both lower limbs with complete loss of sensation and exacerbated lower limb reflexes with clonus. The patient denied any past medical illness and was not on any regular medications. She was a nonsmoker, did not consume alcohol, and had no previous similar attacks. At presentation, the patient had stable vital signs, was fully conscious, and afebrile.

The patient underwent urgent T1-2 laminectomy, revealing a surprising subdural hematoma with no pathological vessels observed. Complete evacuation of the hematoma was achieved without complications. Postoperatively, the patient showed improvement in neurological functions, with motor strength assessment at 4/5 in the left leg (flexion and extension) and 3/5 on the right leg. Further rehabilitation was planned, including occupational therapy sessions for lower limb strengthening exercises, physiotherapy sessions for safe ambulation, and outpatient neuro occupational therapy referrals for lower limb muscle strengthening.

The implications of this case underscore the importance of considering spontaneous spinal subdural hematoma in the differential diagnosis of patients presenting with similar symptoms, as early recognition, prompt surgical intervention, and comprehensive rehabilitation are crucial for optimal patient outcomes in this challenging clinical scenario.

Multiple Slit Durotomies in Decompressive Craniectomies for Reduction of Severe Intracranial Hypertension in Children

Noa Schwartz, Ivan Novitsky, Ido Ben Zvi, Amir Kershenovich
Neurosurgery, Schneider Children's Medical Center of Israel, Petah Tikva, Israel

Introduction: In the past decade, slit durotomies as opposed to dural opening and duraplasty, have been performed in the setting of decompressive craniectomy (DC), both to alleviate increased ICP as well as to evacuate subdural hematomas. The advantages described range from prevention of brain herniation towards the craniectomy and vascular kinking, shorter surgeries and easier cranioplasties. While mortality, complications and functional outcomes have not been shown to be statistically different compared to the duraplasty cohorts.

To our knowledge, no cases of slit durotomies in the traumatic setting have been described in young children. We here present our experience with 4 cases performed in the past year at our Institution.

Methods: We retrospectively reviewed four cases in which a decompressive craniectomy (uni or bilateral) was performed with multiple slit durotomies in children.

Results: Four children underwent slit durotomies during their DCs between 8.2023 and 4.2024 after sustaining severe brain injuries from a motor vehicle accident, gunshot, fall and traumatic birth delivery.

Their GCS at arrival ranged from 5-7. In three cases, the DCs were bilateral, and one was unilateral.

In three cases, the DC was performed at arrival to the hospital and in one case, 4 days after admission due to intractable intracranial hypertension.

We assessed the length of surgery, postoperative complications, another surgery for duraplasty after durotomies, control of intracranial hypertension after durotomies, findings at cranioplasty and Glasgow outcome scores at cranioplasty.

Conclusions: Multiple slit durotomies were effective at reducing ICP and controlling it for the rest of the hospital admission. There was no need for additional duraplasties. It is possible that slit durotomies, especially in young children, may prevent intraoperative complications related to brain herniation, massive bleeding, and brain infarction. These findings encourage us to continue to explore this technique for future cases.

Learning Curve in Robotic Stereoelectroencephalography

Sami Heymann, Zvi Israel
Department of Neurosurgery, Hadassah Medical Center, Jerusalem, Israel

Robotic-assisted Stereoelectroencephalography (SEEG) is an emerging technology that gradually replace the manual frame-based technique for depth electrodes implantation in refractory epilepsy patients. Adoption of a new surgical technology always involves an adjustment period on the part of the surgical team. Challenges discovered during the first cases are investigated and workflow modifications are done based on clinical experience and intuition.

This study demonstrates operative workflow evolution and learning curve for the Medtronic Stealth Autoguide robotic SEEG system. We will present a retrospective analysis of the first 10 robotic-assisted SEEG ceases in a single institution. The criteria to evaluate the improvement over time will be: mean target point error, total operative time and operative time per electrode.

The lessons learned in the process of those first cases may facilitate the incorporation of this robotic platform in other institutions in order to improve the operative efficiency and safety.

Evacuation of CSDH, Best Approach Anterior or Posterior

Abed Siag[1], Israel Melamed[2], Rimah Yousef[3], Elad Avraham[2]
[1]Neurosurgery, Shari Zedek Medical Center, Jerusalem; [2]Neurosurgery, Soroka Medical Centre, Beer Sheva; [3]Pediatric, Soroka Medical Centre, Beer Sheva, Israel

Background: CSDH is the most common type of intracranial hemorrhage that encountered in daily neurosurgical practice.
The psychophysiology is minimal trivial trauma, in curtain circumstances the cause cannot be identified. risk factors include old age, patients on blood thinners and other risks that will be discussed later.
It hypothesized that the resultant haematoma make the blood vessels fragile and fibrinolysis prevents clot formation and results in continuation of haemorrhage.
The aim of the study is to explore any statistically significant preferred surgical technique.
Methods: The results of operated patients between 2012-2021 were studied retrospectively, by mean of initial GCS and neurological status, clinical presentation, use of conservative therapy (steroids therapy), time for surgical drainage (immediately, within 6 hours or in the next surgical day. Preoperatively the medical condition of the patient including drugs administrated where examined, patients on blood thinners received antidote accordingly.
surgical treatment method whether burr hole, minicraniectomy, minicraniotomy.
we studied the type of drainage system whether subcutaneous or subdural drain.
all the patients were treated in our neurosurgical department by experienced neurosurgeon and where admitted to the NICU post operatively and treated by neurosurgical team.
The postoperative outcome was examined by way of improvement of neurological deficit and the GCS (clinically) radiologically by resolution of mass effect in the postoperative brain CT and improvement of mass effect together with the postoperative subdural air /fluid.
Conclusion: Anterior approach is superior to posterior approach by means of post-operative hematoma evacuation and general condition than posterior approach.

The Path of Endovascular Stroke Treatment from Intraarterial Thrombolysis to Stentriever Mechanical Thrombectomy

Maria del Pilar Anleu Saravia[1], Marco Zurita[1], Samuel Moscovici[1], Andres Vargas[1], Hans Henkes[2], Jose Cohen[1]

[1]Neurosurgery, Hadassah Ein Kerem, Jerusalem, Israel; [2]Neuroradiology, Neuroradiological Clinic, Klinikum Stuttgart, Stuttgart, Germany

Thromboembolic occlusion of brain supplying arteries have been recognized as a cause of ischemic stroke since the XVIIth century. Acute occlusions of large cerebral vessels are associated with high rates of morbidity and mortality. Starting the pathway for treating this condition, intravenous thrombolysis was performed, resulting in a low ability to recanalize large thrombi and embolic occlusion of large vessels, being associated with poor outcomes.

For the past 65 years interventional neuro radiologists have sought methods to reopen acutely occluded intracranial vessels, in an image-guided manner by using catheters. Attempts were performed with different devices, like balloons (originally designed for angioplasty), microsnares (for removal of foreign bodies), then mechanical thrombectomy (to fragmentation, thrombus destruction and aspiration devices) was attempted with corkscrews, brushes and baskets. None of such being able to achieve significant rate of adequate recanalization. By 2013 Stent Retriever was introduced with a proven success rate of >90%.

The low rate of success and adequate recanalization with the help of developing devices made the selection of patients undergoing **such procedures** highly selective. Since the development and technique evolution of the stentriever for MT the limited selectiveness of patients has been pushed forward and it is an everyday evolution to whom this procedure is being proved beneficial.

This presentation aims to describe the path and history of endovascular stroke treatment.

What You Want to Know About Endovascular Therapy in Acute Ischemic Stroke. Part I and II

Maria del Pilar Anleu Saravia, Rotem Hershkovitch, Moatasm Shweiki,
Raslan Abu Jusin, Jose Cohen
Neurosurgery, Hadassah Ein Kerem, Jerusalem, Israel

After the introduction of stentriever device for mechanical thrombectomy, as a treatment for acute occlusion of large brain supplying arteries, in 2015 the combination with IVT was demonstrated to be superior to best medical treatment alone, in patients with anterior circulation stroke.

MT was initially promoted for LVO of anterior circulation, within a 6-hour time window. However, it has been proven to be beneficial in a broader group of patients, including posterior circulation stroke or longer than or even unknown time onset. Still some aspects are controversial.

Different aspects of indication for MT will be discussed, like patient selection (age, different time of onset of symptoms, patients with or without disabling symptoms), bridging therapy. Alongside with technical aspects of the procedure that are proven to affect positively for an excellent reperfusion following the MT.

Recanalization of different intracerebral arterial occlusion, LVO and MVO, anterior and posterior circulation, collaterals. Different subjects will be discussed like Tandem occlusions, recurrent LVO, low ASPECTS, low NIHSS score.

As well as procedural complications.

In this two-part presentation it is intended to provide overview of patient selection, technique preference and indications for endovascular therapy in patients with acute ischemic stroke.