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Oral e-Poster Presentations - Booth 1: Skull Base 1 (Pituitary), September 25, 2023, 4:10 PM - 4:50 PM

Background: Cushing syndrome is a rare endocrine disorder. Its incidence is approximately 13 per million people annually. Approximately 70% of Cushing syndrome is the result of Cushing's disease (CD). Transspenoidal surgery (TSS) to resect an ACTH secreting adenoma is the first-line treatment for Cushing's disease.

Methods: We retrospectively studied our patients' data, which underwent TSS for resecting an ACTH secreting adenoma in our hospital from 2019 to 2023. We studied the demographics, clinical conditions pre and post operatively, treatment methods, histology reports. A statistical analysis was performed.

Results: A total of 30 patients with CD were operated with a total of 31 ETSSs. Electromagnetic Neuronavigation was routinely used. 1 patient was not diagnosed pre-operatively and 1 patient was lost to follow-up so they were excluded. Pre-operative MRI localized an adenoma in 15/28 (53.6%) patients. IPSS was performed in 82.14% of the patients. As remission we considered a 2nd post-op day cortisol <5μg/dl. In total of 20 out of 28 patients (71.4%) were in remission. When the adenoma was visible our remission rate was 86.7% (13/15) and when there was no visible adenoma (13/28, 46.4%) the remission rate was 53.85% (7/13). There was no major complication (CSF leakage, vascular injury, visual deterioration, meningitis). At the start of 2022 we started using a new operative technique, called diving surgery, and we observed an overall increase in our remission rate by 10.3%.

Conclusions: Cushing's disease is a rare and challenging condition that requires the collaboration of both the neurosurgeon and an expert endocrinologist.

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DIFFERENCES IN INTRAOPERATIVE SAMPLING DURING MENINGIOMA SURGERY REGARDING CNS INVASION – RESULTS OF A SURVEY ON BEHALF OF THE EANS SKULL BASE SECTION

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Oral e-Poster Presentations - Booth 1: Skull Base 2, September 26, 2023, 4:10 PM - 4:50 PM

Background: Invasive growth of meningiomas into CNS tissue is rare but of prognostic significance. While it has entered the WHO classification as a standalone criterion for atypia, its real prognostic impact is controversial. Retrospective analyses, on which the current evidence is based, show conflicting results. Discordant findings might be explained by different intraoperative sampling methodologies that lead to heterogenous histopathological diagnostic yield.

Methods: To assess the currently applied sampling methods in the light of the novel prognostic impact of CNS invasion, an anonymous survey was designed and distributed via the EANS website and E-Mail newsletter. The survey was open from June 5th 2022 until July 15th 2022.

Results: Overall, 155 responses were submitted, and after exclusion of 13 incomplete responses, 142 (91.6%) datasets were used for further statistical analysis. Only 47.2% of the participants' institutions utilize a standardized sampling method during meningioma surgery, and 54.9% regularly attempt a complete sampling of the area of contact between the meningioma surface and adjacent CNS tissue. The majority did not change their sampling practice since the WHO classification of 2016 (77.5%). More participants agreed with the statement that CNS invasion could be detected intraoperatively (82.4%) compared to detection by preoperative MR-imaging (58.5%). Intraoperative suspicion of CNS invasion changes the sampling for half of the participants (49.3%). An additional sampling of suspicious areas of interest is done in 53.5%. Dural attachment and adjacent bone are more readily sampled separately if tumor invasion is suspected (72.5% and 74.6%, respectively), compared to meningioma tissue with signs of CNS invasion (59.9%).

Conclusions: Current intraoperative sampling methods during meningioma resection vary among neurosurgical departments. In light of the integration of CNS invasion into the WHO classification, insufficient awareness of the need for a structured and complete sampling to optimize the diagnostic yield of CNS invasion exists. A standardized sampling recommendation is needed.

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IMMUNOHISTOCHEMICAL EXPRESSION OF COX2 IN VESTIBULAR SCHWANNOMAS IS ASSOCIATED WITH TUMOR INFILTRATION WITH MACROPHAGES AND LYMPHOCYTES.

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Oral e-Poster Presentations - Booth 1: Skull Base 2, September 26, 2023, 4:10 PM - 4:50 PM

Background: There is increasing evidence for the involvement of inflammatory processes in the genesis and growth of vestibular schwannomas. COX2 has been shown to be highly expressed in vestibular schwannomas and its role in tumor progression and as a potential therapy target are frequently discussed. However, the role of COX2 in vestibular schwannoma is still poorly understood.

Methods: We analyzed the expression of COX2 and markers for macrophage (CD163 and CD68) and lymphocyte infiltration (CD3 and CD8) in 1065 vestibular schwannoma tumor samples. Semiquantitative scoring systems were applied for the assessment of COX2, CD163 and CD68 expression while CD3 and CD8 immunopositivity was quantified via manual counting. Furthermore, clinical data was included in the uni- and multivariate analyses.

Results: An increased COX2 expression was associated with more extensive macrophage infiltration in vestibular schwannoma samples (CD68 and CD163 each $p<0.0001$). Additionally, lymphocyte detection was also higher in tumors with higher COX2 immunopositivity (CD3 and CD8 each $p<0.0001$). Furthermore, with each higher score for COX2 expression the infiltration with lymphocytes and macrophages increased significantly ($p<0.0001$).

Conclusions: The extent of COX2 expression in vestibular schwannomas is clearly correlated with increased infiltration with lymphocytes and macrophages reflecting inflammatory processes.

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FACTORS ASSOCIATED WITH GIANT VESTIBULAR SCHWANNOMA SIZE.

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Oral e-Poster Presentations - Booth 1: Skull Base 2, September 26, 2023, 4:10 PM - 4:50 PM

Background: The size of vestibular schwannomas shows marked variations, ranging from small intrameatal lesions to giant tumors that compress multiple structures of the cerebellopontine angle (CPA). Giant vestibular schwannomas are defined by a CPA diameter of at least 40 mm and factors that are associated with giant size at clinical presentation are still poorly understood.

Methods: A retrospective analysis of 907 sporadic vestibular schwannomas that were treated at our center were analyzed for clinical and immunohistochemical factors that are associated with giant tumor size. Age, gender, tumor status (primary vs. recurrent tumor), prior radiotherapy, volumetric tumor size, and immunohistochemical markers of proliferation (MIB1), lymphocyte infiltration (CD3 and CD8) and macrophage infiltration (CD68 and CD163) were analyzed.

Results: Overall, 36 of 907 tumors (4.0%) were giant vestibular schwannomas and were associated with cyst formation ($p<0.0001$) and higher expression scores for macrophage marker CD163 ($p<0.0001$). There were no differences in age, gender, prior radiotherapy, recurrent tumor status, MIB1 expression, CD68,

CD3 and CD8 expression. In the multivariate nominal logistic regression cyst formation and higher CD163 expression were associated with giant size.
Conclusions: Giant vestibular schwannomas are associated with cystic growth and show an increased infiltration with CD163 positive macrophages.

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DIAMOND KNIFE DISSECTION TECHNIQUE FOR COCHLEAR AND FACIAL NERVE PRESERVATION DURING RESECTION OF VESTIBULAR SCHWANNOMAS (VS)

Karl Roessler[1], Dorian Hirschmann[1], Julia Shawarba[1], Matthias Tomschik[1]. [1] *Medical University Vienna, Neurosurgery, Austria*

Oral e-Poster Presentations - Booth 1: Skull Base 2, September 26, 2023, 4:10 PM - 4:50 PM
Background: Facial and cochlear nerve preservation is a major effort, especially in large vestibular schwannomas. Bimanual dissection techniques using pincers or plate knifes have been found as a crucial step for hearing preservation and avoiding facial palsy. We investigated a newly described technique using a diamond knife for nerve dissection during VS removal.
Methods: A retrospective investigation including 61 VS patients during a periode of 3.5 years was performed comparing plate-knife and diamond knife dissection during tumor removal. Altogether, 51 patients were operated using the standard plate knife technique (52yrs mean age, tumor diameter mean 20 mm) and 10 patients were operated using the diamond knife technique (46 yrs mean age, mean tumor diameter 22 mm).
Results: In the standard group, postoperative useful hearing preservation was achieved in 45% and permanent facial nerve palsies detected in 9.8%. On the contrary, in the diamond knife dissection group postoperative hearing preservation was found in 70% und permanent facial nerve palsies in 0% (differences highly significant). In both groups complete resection was found in 84% and 90%, small tumor residuals on the facial nerve (small postop linear MRI enhancement) found in 16% and 10%.
Conclusions: The newly described diamond knife dissection technique seems to have a significant better hearing outcome and facial nerve preservation rate in otherwise comparable patients during surgery of vestibular schwannomas.

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SURGICAL OUTCOME OF FORAMEN MAGNUM MENINGIOMAS AS PREDICTED BY TOPOGRAPHIC POSITION RELATIVE TO NEUROVASCULAR BUNDLE, A NOVEL CLASSIFICATION

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Oral e-Poster Presentations - Booth 1: Skull Base 2, September 26, 2023, 4:10 PM - 4:50 PM
Background: Proximity to critical neurovascular structures can create significant obstacles during the surgical exposure and resection of foramen magnum meningiomas (FMMs) to the detriment of treatment outcomes. Building on previous FMM classifications by symptomology and radiographic findings, we propose a new classification that defines the relationship of the tumor to neurovascular structures and assess correlation with clinical outcomes.
Methods: In this retrospective review, 31 patients underwent primary resection of FMMs through a far lateral approach. We grouped FMMs based on topographic position of the neurovascular bundle relative to tumor as Type 1, bundle ventral to tumor; Type 2a-c, bundle superior, inferior, or splayed, respectively; Type 3, bundle dorsal; and Type 4, nerves and/or vertebral artery encased by tumor.
Results: In our 31 patients ranging from 29-81 years old, maximal tumor diameter averaged 30.3 mm (range 12.7-56 mm). Preoperatively 16 (52%) patients had cranial nerve (CN) dysfunction, 9 (29%) had motor weakness, and 7 (23%) had sensory deficits. Tumor type in our classification was relevant to surgical outcomes: Types 3 and 4 demonstrated lower rates of gross total resection, 67% and 65%, and worse immediate postoperative CN outcomes, 33% and 40%, respectively. Long-term findings showed Types 2c, 3, and 4 demonstrated worse CN outcomes; one Type 4 had worse motor outcomes; and no patients had worse sensory outcomes.
Conclusions: In this small cohort, our FMM proposed classification defined by the tumor-neurovascular bundle configuration correlated well with surgical resection, complications, and clinical outcomes and thus warrants study.

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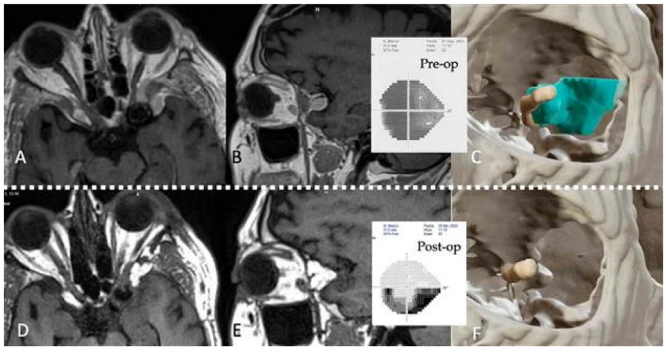
ENDOSCOPIC TRANSORBITAL APPROACH FOR THE MANAGEMENT OF SPHENO- ORBITAL MENINGIOMAS: LITERATURE REVIEW AND PRELIMINARY EXPERIENCE.

Alberto Di Somma[1], Andrea De Rosa[2], Abel Ferres[1], Alejandra Mosteiro[1], Giulia Guizzardi[1], Jessica Matas[1], Thomaz Topceski[1], Luis Reyes[1], Pedro Roldan[1], Ramon Torne[1], Isam Alobid[1], Joaquim Enseñat[1]. [1] *Hospital Clinic De Barcelona, Spain;* [2] *Università degli Studi di Napoli Federico II*

Oral e-Poster Presentations - Booth 1: Skull Base 2, September 26, 2023, 4:10 PM - 4:50 PM
Background: Endoscopic transorbital approach represents a minimally invasive route which could be particularly appropriated for the management of spheno-orbital meningiomas. We provide a systematic review of the literature, together with four illustrative cases, about the management of spheno-orbital meningiomas by means of the minimally invasive endoscopic transorbital route, underlining clinical scenarios in which such strategy could be best indicated.
Methods: A systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Available data including patients' demographics, tumors' features, surgical and post-operative outcomes were collected.
Results: Data of 58 patients, both from 9 selected records and from authors' surgical series, were collected. Rates of subtotal, near-total and gross-total resection were 44,8%, 10,3% and 32,7%, respectively. Rates of symptoms improvement after surgery were 100% for proptosis, 93% for visual impairment and 87% for ophthalmoplegia. The most common post-operative complications were transient ophthalmoplegia and V2 hypoesthesia. Cerebro-spinal fluid leak was reported in 2 patients.
Conclusions: Our findings support the applicability of the transorbital approach for the management of spheno-orbital meningiomas, particularly in at least three clinical scenarios: 1) when predominant hyperostotic bone is present; 2) when a globular tumor, not showing excessive medial or inferior infiltration, is addressed; 3) as part of a multi-staged treatment for diffuse lesions.
Optional Image



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GIANT HYPERVASCULARIZED SHCWANNOMA: A CASE PRESENTATION AND LITERATURE REVIEW.

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