Results: The CSF leak recurred for the third time shortly after the second repair. The defect was then approached via a mini-facial translocation approach. A left lateral rhinotomy incision was made and the left nasal, frontal, and maxillary bones were exposed. After osteotomies were made, the maxillary sinus was rotated laterally exposing the sphenoid sinus. Rongeurs were used to open the sphenoid sinus and direct visualization of the CSF leak in the left lateral aspect of the sphenoid sinus was obtained. The leak was isolated and repaired with fat grafting, fibrin glue, and middle turbinate mucosa by neurosurgery.

Conclusion: The patient has had an uneventful recovery with good cosmesis and no recurrence of the CSF leak.

P088
A Three Layers Technique to Close a Persistent Tracheoesophageal Fistula
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Objectives: A tracheoesophageal (TE) fistula is commonly made to fit in a provox valve after total laryngectomy. Occasionally the valve was removed following complication that had occurred or the patient no longer wants to use the provox valve. The TE fistula will need to be closed. We described a technique using the stenocleidomastoid rotation flap to close the fistula.

Methods: The fistula is approached via a skin incision along the superior margin of the tracheostoma. A skin flap together with the trachea is elevated away from the esophagus until the fistula is completely accessible. The fistula is excised and the esophageal opening is closed. A local flap is rotated from the adjacent sternocleidomastoid muscle over the esophageal closure and placed in situ. The posterior wall of the trachea opening is closed separately.

Results: This technique was used in 2 patients who had persistent TE fistula following removal of provox valve. Both recovered well and were able to take orally well 5 days post operation. The recovery was uneventful.

Conclusion: This technique was not described before and was noted to be effective and simple to close persistent TE puncture. A larger series are being collected currently.

P089
Effect of Functional Endoscopic Sinus Surgery on the Maxillary Sinus Mucosa
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Objectives: The exact physiopathology of chronic rhinosinusitis (CR), associated or not with nasosinus polyps, is still unknown.

Methods: Thirty patients with CR and nasosinus polyps were evaluated for morphological alterations of the maxillary sinus mucosa. The patients were divided into 3 groups. Biopsies were collected during surgery (group 1) and 1 year thereafter during a second surgery, from patients with recurrent disease (group 2) and patients showing clinical cure (group 3). Biopsy material from 4 cadavers was used as control.

Results: Group 1 patients presented clearly visible histopathological alterations: normal respiratory epithelium but with an inflammatory process infiltrating the submucosa (N = 2), atypical respiratory epithelium accompanied by an important increase in the number of goblet cells (N = 2), metaplasia (N = 3), and a mixed epithelium (N = 3). Inflammation of variable degree infiltrating the submucosa was observed in all cases. Group 2 patients showed the same alterations but accompanied by ciliary dysmorph in all cases. A normal respiratory epithelium was observed in all patients of group 3, with areas containing an increased number of goblet cells being identified in 2 patients, a reduction in the number of ciliated cells and cilia in 2 other patients, and ciliary morphological alterations in 1 patient.

Conclusion: This study demonstrates that recovery of the maxillary sinus mucosa of patients with CR is incomplete 1 year after endoscopic surgery, indicating the need for continuous follow-up of these patients.
patients (13.9%), moderate to severe retraction of the tympanic membrane was the main finding. There was a linear correlation between patient age and the presence of otolaryngologic findings; middle ear effusions were less frequent with increasing age, whereas the occurrence of chronic conditions such as moderate/severe retraction and otitis media with or without cholesteatoma were more common among older patients.

**Conclusion:** Continued otolaryngological evaluation of the patients with cleft palate allows for early intervention and for the preservation of the integrity of the middle ear of these patients.

**P091**

**A Significance of Navigation System in Temporal Bone and Head and Neck Surgery**

Satoshi Fukuda, MD PhD (presenter); Masahiko Sakeki, MD; Eiji Chida, MD PhD; Masaaki Kashiwamura, MD PhD; Yuji Nakamura, MD; Akihiro Komma, MD PhD; Yasushi Furuta, MD PhD; Sapporo Japan; Sapporo Japan; Sapporo Japan; Sapporo Japan; Sapporo Japan; Sapporo Japan

**Objectives:** Navigation surgery has allowed for advantage in nasal surgery. But the significance of this system especially in accuracy for temporal bone is considered to be still controversial. On the other hand, actual indication of navigation system for head and neck lesion is also still controversial. This study evaluated the accuracy of this system for temporal bone lesions and the significance of this system for head and neck lesions.

**Methods:** Fifty patients with temporal bone lesions (28 cholesteatoma, 6 congenital aural atresia, 6 cochlear implant including ossified cochlea, 4 facial nerve lesion, 3 re-operative chronic otitis media, and 3 petrous apex lesions) were operated with the use of navigation system. We also applied this system for 3 trigeminal schwannoma, 3 osteoma and 3 petrous apex lesions) were operated with the use of navigation system. We also applied this system for 3 trigeminal schwannoma, 3 osteoma and 3 petrous apex lesions.

**Results:** The accuracy in our temporal bone series was 0.32 mm on an average. So, it was significantly useful to recognize and observe the target points and aimed structures accurately. Also it was useful in head and neck surgery to determine the accurate bone resection line and to recognize the target points, so we enter more straightly to the lesion.

**Conclusion:** In conclusion, this navigation system ensures supplemental safe, accurate, and reliable surgery and also is considered to be useful for academic explanation to medical students and academic training for residents. A congenital anomaly, re-operative cases, petrous apex lesion and some head and neck lesion are regarded as a good indication.

**P092**

**Topical Sirolimus for Prevention of Subglottic Stenosis in a Rabbit Model**

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**Objectives:** To utilize an established animal model to test the ability of topical sirolimus, a macrolide immunosuppressant, to prevent or reduce subglottic stenosis.

**Methods:** Pasteurella-free New Zealand white rabbits were injured in the subglottic mucosa by a cricoid split procedure and laser. Each of the rabbits in 3 groups received either saline, mitomycin, or sirolimus atomized by direct laryngoscopy to the injured mucosa every 4 days over 3 subsequent weeks. The animals were subsequently sacrificed and the larynges examined grossly and histologically.

**Results:** Our model predictably resulted in inflammation and subglottic scarring in controls (saline). Mitomycin inhibits subglottic scarring but prevents epithelialization and resulted in early rabbit mortality. Sirolimus prevents scar formation, inflammation, does not interfere with epithelialization, and did not result in animal mortality.

**Conclusion:** We believe that the animal model described above is an excellent model for studying subglottic stenosis. The histologic changes within the lamina propria of the injured airway demonstrate chronic inflammatory cell infiltrate and fibroplasia. These findings are quite similar to the changes that occur within normal skin with hypertrophic scarring and keloid formation. Sirolimus is a potent inhibitor of key elements of fibrosis: namely fibroblast proliferation and production of growth factors that stimulate the laying down of wound matrix and collagen formation. Our preliminary study suggests that sirolimus may be an effective topical agent that will inhibit tissue fibrosis and subglottic scarring.

**P093**

**Development of a Novel Technique for Laser Reconstruction of the Dura**

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Tel Aviv Israel; Tel Aviv Israel

**Objectives:** Laser tissue welding is a technology that was used for soldering of various tissues, which can be faster, less traumatic and easier to apply than conventional methods. The objective of this study was to take advantage of the laser soldering system, and to develop a simple and reliable technique for repair of dural holes after excision of brain tumors.

**Methods:** We used a CO2 fiber optic laser system that was developed by us for monitoring and controlling heated tissue in situ and in real time, for reducing the damage to the brain parenchyma. The system was used for soldering of dura and free fascial grafts in an animal model using pigs. Direct digital measurements of mechanical force interaction were used for tension and pressure.

**Results:** The difference between the breaking point of the retractor scan and the baseline was used to calculate the peak adhesive force (PAF) acting between the 2 tissues. We have performed 35 experiments in order to calculate the mean PAF of fascia-dura welding. Seven more experiment were performed using biological glue for comparison of the PAF. The