

Comparison of stapedotomy minus prosthesis, circumferential stapes mobilization, and small fenestra stapedotomy for stapes fixation

OBJECTIVE: To compare the outcomes of 3 surgical techniques for primary stapes fixation: stapedotomy minus prosthesis (STAMP), circumferential stapes mobilization (CSM), and small fenestra stapedotomy (SFS). **STUDY DESIGN:** Retrospective review of 277 primary cases operated for stapes fixation from 1997 to 2007. **SETTING:** Tertiary academic center. **PATIENTS:** Consecutive adult and pediatric cases operated for conductive hearing loss because of stapes fixation. **INTERVENTIONS:** STAMP was performed for otosclerosis limited to the anterior footplate, CSM was conducted for congenital stapes fixation, SFS was performed for more extensive otosclerosis or anatomic contraindications to STAMP/CSM. **MAIN OUTCOME MEASURES:** Pure-tone audiometry was performed preoperatively and postoperatively (3-6 wk) and the most recent long-term results (≥ 12 mo). **RESULTS:** Ninety-nine ears in 90 patients had audiologic follow-up data over 12 months. Sixty-seven ears (68%) underwent SFS, 16 (16%) STAMP, and 16 (16%) CSM. There was significant improvement in average air conduction (AC) thresholds and air-bone gap (ABG) for all techniques. Mean ABG for SFS closed from 29 to 7.1 dB (SD, 6.0), for STAMP from 29 to 3.8 dB (SD, 5.8 dB), and for CSM from 34 to 20 dB (SD, 8.2 dB). AC results were better in the STAMP than in the SFS group, especially in high frequencies. Bone conduction improvements were seen in all groups, highest in STAMP (4.3 dB) and CSM (3.8 dB) groups, but the differences between groups were not statistically significant. **CONCLUSION:** Satisfactory hearing results were achieved with all the techniques, and STAMP showed better hearing outcomes, especially in high frequencies. CSM is a good option for children and patients in whom it is desirable to avoid a footplate fenestration or prosthesis. CSM and STAMP had significantly higher rates of revision for refixation than SFS.

General information

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Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Ear Nose Throat Department, University of Ottawa, Canada, Harvard Medical School, Electrical Engineering Department, University of California, Los Angeles (UCLA)

Contributors: Acar, G. O., Kivekäs, I., Hanna, B. M., Huang, L., Gopen, Q., Poe, D. S.

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ASJC Scopus subject areas: Otorhinolaryngology, Sensory Systems, Clinical Neurology

Keywords: Circumferential stapes mobilization, Hearing outcome, Otosclerosis, Small fenestra stapedotomy, Stapedotomy minus prosthesis, Stapes fixation

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Research output: Contribution to journal > Article > Scientific > peer-review

The developing management of esthesioneuroblastoma: A single institution experience

Esthesioneuroblastoma remains a challenging disease because of its rarity, the complexity of surrounding structures, missing opinions of optimal treatment protocol, and complications associated with necessary surgery. Our objective was to analyse the management and outcome of a cohort of patients with esthesioneuroblastoma from 1990 to 2009 in a tertiary medical centre. There were 17 eligible patients (8 males and 9 females) with the median age of 53 years (range 20-75 years). An obvious inconsistency was noted in the management of the various tumours of the present series during the two decades due to a lack of a uniform treatment protocol. The median follow-up time was 57.5 months (range 3-158 months). Nine patients (seven with curative treatment intent) died of the disease with the median time from diagnosis to death of 60 months (range 3-161 months). Eight patients had no evidence of the disease at last follow-up visit (median 76 months, range 24-119 months). Recurrences were documented in seven of the patients. The median time from end of primary treatment to a recurrence was 57 months (range 6-110 months). The 5-year overall survival and disease-free survival was 68 and 62%, respectively. The management of ENB should be planned by an experienced head and neck surgeon as part of a multidisciplinary team in a tertiary referral setting. Multimodality therapy with long-term follow-up is preferable and should be set based on the available disease-specific classifications for clinical staging and histopathological grading.

General information

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Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Helsinki University Central Hospital, Tampere University Hospital

Contributors: Bäck, L., Oinas, M., Pietarinen-Runtti, P., Saari-Lahti, K., Vuola, J., Saat, R., Öhman, J., Haglund, C., Niemelä, M., Leivo, I., Hagström, J., Mäkitie, A. A.

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Keywords: Classification, Olfactory neuroblastoma, Radiotherapy, Surgery, Survival, Treatment

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Research output: Contribution to journal › Article › Scientific › peer-review

Facial subcutaneous emphysema after tonsillectomy

Background: Tonsillectomy is a commonly performed and relatively safe surgical procedure. However, it can potentially be associated with several complications. We report a case of facial subcutaneous emphysema that occurred after elective tonsillectomy. Case: Tonsillectomy was performed on a patient with a history of frequent tonsillitis. After surgery, the patient developed facial subcutaneous emphysema that resolved within a few days without any further complications. Conclusion: Subcutaneous emphysema is a rare complication of tonsillectomy. Tonsil should be removed along the tonsillar capsule. If its removal causes a deeper than usual mucosal tear up to the level of the muscles, then air might potentially pass through the pharyngeal wall to the parapharyngeal, retropharyngeal and prevertebral spaces.

General information

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Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital

Contributors: Bizaki, A., Kääriäinen, J., Harju, T., Rautiainen, M.

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Article number: 11

Original language: English

ASJC Scopus subject areas: Otorhinolaryngology, Dentistry(all), Clinical Neurology, Medicine(all)

Keywords: Complication, Subcutaneous emphysema, Tonsillectomy

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Research output: Contribution to journal › Article › Scientific › peer-review

Quality of life after endoscopic sinus surgery or balloon sinuplasty: A randomized clinical study

Objectives: To conduct the first prospective randomized controlled trial that evaluates and compares the clinical outcome and impact of balloonsinuplasty and endoscopic sinus surgery (ESS) on the quality of life of patients suffering from chronic or recurrent rhinosinusitis (CRS) of the maxillary sinus.

Methods: Adult patients with symptomatic chronic or recurrent rhinosinusitis without severe findings in the sinuses, as documented in the sinus' Computer Tomography scan and clinical exam, were randomized in 2 groups: ESS and Balloon Sinuplasty. The main variable in our study is the Sinonasal Outcome Test-22 (SNOT 22) and its parameters. These parameters were analysed preoperatively and at 3 months, postoperatively.

Results: There was a subjective improvement in symptoms after surgery. We also noticed an objective improvement in the quality of life of our patients seen as a decrease in the total SNOT 22 score. Both balloon sinuplasty and ESS significantly improved almost all the parameters of SNOT22, with no significant difference being found between these two groups.

Conclusion: Both balloon sinuplasty and endoscopic sinus surgery improved the quality of life of patients with mild chronic or recurrent rhinosinusitis. However, the remarkably higher material cost of balloon sinuplasty compared to ESS sets limits on its broad use. There is an obvious need for further study to find out if, as an office procedure, balloon sinuplasty could deliver cost-savings high enough to cover the higher material cost of balloon sinuplasty. Our study was, however, too small to enable firm conclusions to be drawn.

General information

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Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), School of Management (JKK), Department of Otorhinolaryngology

Contributors: Bizaki, A. J., Taulu, R., Numminen, J., Rautiainen, M.

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ASJC Scopus subject areas: Otorhinolaryngology, Medicine(all)

Keywords: Airway inflammation, Balloon sinuplasty, Endoscopic sinus surgery, Quality of life, Rhino-sinusitis

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Research output: Contribution to journal › Article › Scientific › peer-review

Acute supraglottitis in adults in Finland: Review and analysis of 308 cases

Objective: The aim of this article is to study the clinical features, management, and outcome in adult patients with acute supraglottitis. **Study Design:** Retrospective review. **Methods:** We searched the medical records from our database from the years 1989 to 2009 using codes of international statistical classification of diseases and related health problems for acute epiglottitis or supraglottitis. In total, 308 patients were identified. **Results:** Incidence of acute supraglottitis increased from 1.88 (first decade) to 4.73 per 100,000 cases (second decade) ($P = .05$). The mean age of the patients was 49 years old with a slightly male predominance. Sore throat and odynophagia were the most common symptoms. Concomitant disease were common among the patients. Isolated inflammation of epiglottis without involvement of other supraglottic tissue was detected only in 51 patients. Intravenous cephalosporins were the most common empiric antibiotic treatment regimen. Intravenous corticosteroids were administered to half of the cases. Streptococcus was the most common organism in throat cultures. In total, 45 patients needed airway intervention. Complications were rare and mortality was 0.6% in our series. **Conclusions:** Acute supraglottitis in adults seems to be a different entity than epiglottitis in children, and inflammation does not usually exclusively involve the epiglottis. Early diagnosis seems to decrease the need for airway intervention and to permit the successful treatment of the patient with intravenous antibiotics and corticosteroids. Streptococcus appears as the dominant causative microorganism. However systemic diseases and other local infections that compromise the regional supraglottic immunity may increase the risk for acute supraglottitis.

General information

Publication status: Published

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Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), School of Management (JKK)
Contributors: Bizaki, A. J., Numminen, J., Vasama, J. P., Laranne, J., Rautiainen, M.
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Ratings:

Scopus rating (2011): CiteScore 2.5 SJR 0.999 SNIP 1.193

Original language: English

ASJC Scopus subject areas: Medicine(all), Otorhinolaryngology

Keywords: airway intervention, dyspnea, epiglottitis, sore throat, stridor, Supraglottitis

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Source ID: 80053176402

Research output: Contribution to journal › Review Article › Scientific › peer-review

A Competing Voices Test for Hearing-Impaired Listeners Applied to Spatial Separation and Ideal Time-Frequency Masks

People with hearing impairment find competing voices scenarios to be challenging, both with respect to switching attention from one talker to the other, as well as maintaining attention. With the Danish competing voices test (CVT) presented here, the dual-attention skills can be assessed. The CVT provides sentences spoken by three male and three female talkers, played in sentence pairs. The task of the listener is to repeat the target sentence from the sentence pair based on cueing either before or after playback. One potential way of assisting segregation of two talkers is to take advantage of spatial unmasking by presenting one talker per ear after application of time-frequency masks for separating the mixture. Using the CVT, this study evaluated four spatial conditions in 14 moderate-to-severely hearing-impaired listeners to establish benchmark results for this type of algorithm applied to hearing-impaired listeners. The four spatial conditions were as follows: summed (diotic), separate, the ideal ratio mask, and the ideal binary mask. The results show that the test is sensitive to the change in spatial condition. The temporal position of the cue has a large impact, as cueing the target talker before playback focuses the attention toward the target, whereas cueing after playback requires equal attention to the two talkers, which is more difficult. Furthermore, both applied ideal masks show test scores very close to the ideal separate spatial condition, suggesting that this technique is useful for future separation algorithms using estimated rather than ideal masks.

General information

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Organisations: Computing Sciences, Oticon A/S

Contributors: Bramsløw, L., Vatti, M., Rossing, R., Naithani, G., Henrik Pontoppidan, N.

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Original language: English

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Keywords: hearing impairment, ideal masks, spatial hearing, speech masker, speech test

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Research output: Contribution to journal › Article › Scientific › peer-review

Minimally invasive functional approach for cholesteatoma surgery

Objectives/Hypothesis: Report the efficacy of a functional minimally invasive approach for cholesteatoma surgery. **Study Design:** Retrospective review of surgical cases performed between 1996 and 2008. **Methods:** One hundred sixty-nine patient charts were reviewed in which ears with primary cholesteatomas that extended beyond the mesotympanum were operated on with a plan for canal wall up (CWU) mastoidectomy. The surgical approach consisted of progressive exposure from transcanal to postauricular tympanoplasty to CWU mastoidectomy, as needed, to identify and lyse the fibrous attachments that bind the capsule to the surrounding mucosa. Endoscopic guidance was employed as appropriate to minimize exposure needs. Any planned second-stage operations were attempted with a transcanal approach if appropriate and with endoscopic assistance. **Results:** One hundred eighty-four ears of 169 patients were included. The median age was 32 years (range, 1-79 years). The mean follow-up was 3.2 years (range, 1-11 years). Eighty-three (45%) were planned for a second-look operation, and three (2%) required unplanned second operations. The overall recurrence rate was 24/184 (13%), and the unexpected residual rate was 5/184 (3%). The residual rate with endoscopy (5/119, 4%), or without endoscopy (1/65, 2%), were not significantly different. Hearing results in 156 ears improved significantly, from a preoperative pure-tone average (PTA) of 41 dB to a postoperative PTA average of 29 dB ($P < .0001$). **Conclusions:** A functional minimally invasive approach to cholesteatoma surgery provided equivalent residual rates but higher recurrence rates compared to published canal wall down mastoidectomy. Endoscopic techniques were helpful in providing adequate views while minimizing exposure.

General information

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MoE publication type: A2 Review article in a scientific journal

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), University of Ottawa, Canada, Harvard Medical School

Contributors: Hanna, B. M., Kivekäs, I., Wu, Y. H., Guo, L. J., Lin, H., Guidi, J., Poe, D.

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Keywords: Canal wall up, Cholesteatoma, Endoscopic, Hearing results, Recurrence, Residual

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Research output: Contribution to journal › Review Article › Scientific › peer-review

Sequential bilateral cochlear implantation improves working performance, quality of life, and quality of hearing

Conclusions: This prospective study shows that working performance, quality of life (QoL), and quality of hearing (QoH) are better with two compared with a single cochlear implant (CI). The impact of the second CI on the patient's QoL is as significant as the impact of the first CI. **Objectives:** To evaluate the benefits of sequential bilateral cochlear implantation in working, QoL, and QoH. **Methods:** We studied working performance, work-related stress, QoL, and QoH with specific questionnaires in 15 patients with unilateral CI scheduled for sequential CI of another ear. Sound localization performance and speech perception in noise were measured with specific tests. All questionnaires and tests were performed before the second CI surgery and 6 and 12 months after its activation. **Results:** Bilateral CIs increased patients' working performance and their work-related stress and fatigue decreased. Communication with co-workers was easier and patients were more active in their working environment. Sequential bilateral cochlear implantation improved QoL, QoH, sound localization, and speech perception in noise statistically significantly.

General information

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Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Helsinki University Central Hospital

Contributors: Härkönen, K., Kivekäs, I., Rautiainen, M., Kotti, V., Sivonen, V., Vasama, J. P.

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Journal: Acta Oto-Laryngologica

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Original language: English

ASJC Scopus subject areas: Otorhinolaryngology, Medicine(all)

Keywords: Ability to work, sound localization, speech perception in noise

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Research output: Contribution to journal > Article > Scientific > peer-review

Single-Sided Deafness: The Effect of Cochlear Implantation on Quality of Life, Quality of Hearing, and Working Performance

Aims: To evaluate the effect of a cochlear implant (CI) on quality of life (QoL), quality of hearing (QoH), and working performance in patients with single-sided deafness (SSD). **Methods:** Using specific questionnaires, we measured QoL, QoH, and working performance in 7 SSD patients scheduled for CI surgery of the affected ear. Sound localization and speech perception in noise were also assessed. All questionnaires and tests were performed before the CI surgery and at 6 and 12 months after CI activation. **Results:** The QoL, QoH, sound localization, and speech perception in noise had improved statistically significantly after CI surgery. Communication with co-workers became easier, and the patients were less fatigued after the working day. **Conclusions:** CI clearly improves QoL, QoH, and working performance in patients with SSD.

General information

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Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Helsinki University Central Hospital

Contributors: Härkönen, K., Kivekäs, I., Rautiainen, M., Kotti, V., Sivonen, V., Vasama, J. P.

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Keywords: Cochlear implant, Quality of hearing, Quality of life, Single-sided deafness, Working performance

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Research output: Contribution to journal › Article › Scientific › peer-review

Eustachian tube mucosal inflammation scale validation based on digital video images

Background: The most common cause for Eustachian tube dilatatory dysfunction is mucosal inflammation. The aim of this study was to validate a scale for Eustachian tube mucosal inflammation, based on digital video clips obtained during diagnostic rigid endoscopy. **Methods:** A previously described four-step scale for grading the degree of inflammation of the mucosa of the Eustachian tube lumen was used for this validation study. A tutorial for use of the scale, including static images and 10 second video clips, was presented to 26 clinicians with various levels of experience. Each clinician then reviewed 35 short digital video samples of Eustachian tubes from patients and rated the degree of inflammation. A subset of the clinicians performed a second rating of the same video clips at a subsequent time. Statistical analysis of the ratings provided inter- and intrarater reliability scores. **Results:** Twenty-six clinicians with various levels of experience rated a total of 35 videos. Thirteen clinicians rated the videos twice. The overall correlation coefficient for the rating of inflammation severity was relatively good (0.74, 95% confidence interval, 0.72-0.76). The intralevel correlation coefficient for intrarater reliability was high (0.86). For those who rated videos twice, the intralevel correlation coefficient improved after the first rating (0.73, to 0.76), but improvement was not statistically significant. **Conclusion:** The inflammation scale used for Eustachian tube mucosal inflammation is reliable and this scale can be used with a high level of consistency by clinicians with various levels of experience.

General information

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Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Harvard Medical School, Tampere University Hospital, Helsinki University Central Hospital

Contributors: Kivekäs, I., Pöyhönen, L., Aarnisalo, A., Rautiainen, M., Poe, D.

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ASJC Scopus subject areas: Otorhinolaryngology, Sensory Systems, Clinical Neurology

Keywords: Dysfunction, Eustachian Tube, Inflammation scale, Video images

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Research output: Contribution to journal › Article › Scientific › peer-review

Is there an optimal location for tympanostomy tube placement?

General information

Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Harvard Medical School

Contributors: Kivekäs, I., Poe, D.

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Original language: English

ASJC Scopus subject areas: Otorhinolaryngology, Medicine(all)

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Research output: Contribution to journal › Review Article › Scientific › peer-review

Unilateral common cavity deformity: Recurrent meningitis due to insufficient newborn hearing screening

Insufficient newborn hearing screening may leave the other ear with undetected hearing loss. Subsequently, the missed pathology behind the impairment may have potential risk for severe infections. We describe a case of recurrent *Streptococcus pneumoniae* meningitis in an infant with unilateral common cavity deformity. The diagnosis of the deaf left ear was delayed due to insufficient newborn hearing screening and not until the second meningitis the pathology behind the deafness was confirmed. Subtotal petrosectomy was performed unsuccessfully and resulted in another meningitis. We highlight the importance of proper newborn hearing screening and surgical technique to treat cochlear malformations.

General information

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MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), School of Management (JKK), Kokkola Central Hospital

Contributors: Kivekäs, I., Vasama, J. P., Weitz-Tuoretmaa, A., Hakomäki, J., Rautiainen, M.

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Keywords: Common cavity, Newborn hearing screening, Recurrent meningitis

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Research output: Contribution to journal › Article › Scientific › peer-review

Histopathology of balloon-dilation eustachian tuboplasty

Objectives/Hypothesis: Surgical intervention of the Eustachian tube (ET) has become increasingly common in the past decade, and balloon dilation has shown promising results in recent studies. It is unclear how balloon dilation enhances ET function. Our aim was to evaluate histological changes in the ET's mucosal lumen comparing before balloon dilation, immediately after, and postoperatively. **Study Design:** Case series. **Methods:** Thirteen patients with bilateral ET dysfunction were enrolled. Biopsies of the ET mucosa were obtained just before balloon dilation; immediately after; and in three cases, 5 to 12 weeks postoperatively. Specimens were retrospectively examined under light microscopy by two pathologists blinded to the clinical information and whether specimens were pre- or postballoon dilation. **Results:** Preoperative biopsies were characterized by inflammatory changes within the epithelium and submucosal layer. Immediate response to balloon dilation was thinning of the mucosa, shearing of epithelium and crush injury to the submucosa, especially to lymphocytic infiltrates. Postoperative biopsies demonstrated healthy pseudocolumnar epithelium and replacement of lymphocytic infiltrate with a thinner layer of fibrous tissue. **Conclusion:** Reduction of inflammatory epithelial changes and submucosal inflammatory infiltrate appeared to be the principal result of balloon dilation. The balloon may shear or crush portions of inflamed epithelium but usually spared the basal layer, allowing for rapid healing.

Additionally, it appeared to effectively crush lymphocytes and lymphocytic follicles that may become replaced with thinner fibrous scar. Histopathology of the ET undergoing balloon dilation demonstrated effects that could reduce the overall inflammatory burden and may contribute to clinical improvement in ET function.

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Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Chang-Gung University, Massachusetts General Hospital, Harvard Medical School, Rikshospitalet-Radiumhospitalet HF

Contributors: Kivekäs, I., Chao, W. C., Faquin, W., Hollowell, M., Silvola, J., Rasooly, T., Poe, D.

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Source ID: 84921675064

Research output: Contribution to journal > Article > Scientific > peer-review

1064-nm Nd: YAG laser-assisted cartilage reshaping for treating ear protrusions

Background Correction of prominent ears is a common plastic surgical procedure. The laser-assisted cartilage reshaping (LACR) technique for protruding ears was developed at the French National Institute of Health and Medical Research in Lille, France, using both the 1064- and 1540-nm wavelengths, with a view to simplifying the surgical procedure. Herein we report our results with the 1064-nm wavelength. **Methods** Between 2008 and 2010, twenty-six 1064-nm LACR procedures in 14 patients were performed. Twelve patients received treatment to both ears, and 2 patients received treatment to one ear. Each procedure consisted of a single treatment session. The treatment consisted of laser irradiation of both sides of the helix with single pulses of 70 J/cm². The beam diameter was 6 mm. Early and late complications were defined and reviewed for all patients. Satisfaction was assessed by patients using a visual analogue scale from 0 (unsatisfied) to 20 (highly satisfied). The superior and middle cephaloauricular distances were prospectively evaluated at 6 months after treatment. **Results** Complications included eight cases of localized skin burns and one case of dermatitis. The mean right/left superior and middle cephaloauricular distances were 10.5±1.5 mm/10.7±1.0 mm and 16.3±2.2 mm/16.3±2.8 mm, respectively, as compared to 17.5±2.9 mm/18.6±2.5 mm (P-

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Frontier Photonics, University of Bern, Lille University Hospital - CHRU, Fundacion Antoni de Gimbernat

Contributors: Leclère, F. M., Mordon, S., Alcolea, J., Martinez-Carpio, P., Vélez, M., Trelles, M.

Number of pages: 7

Pages: 2461-2467

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Peer-reviewed: Yes

Publication information

Journal: LARYNGOSCOPE

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ISSN (Print): 0023-852X

Ratings:

Scopus rating (2015): CiteScore 4 SJR 1.365 SNIP 1.457

Original language: English
ASJC Scopus subject areas: Otorhinolaryngology, Medicine(all)
Keywords: 1064-nm laser, 1540-nm laser, cartilage reshaping, ear protrusion, fluence
DOIs:
10.1002/lary.25294
URLs:

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Source: Scopus

Source ID: 84944512348

Research output: Contribution to journal › Article › Scientific › peer-review

Laser-assisted cartilage reshaping for protruding ears: A review of the clinical applications

Objectives/Hypothesis In 2006, our institute reported the first clinical use of laser-assisted cartilage reshaping (LACR) for protruding ears. Since then, the technique has been developed and refined. This article reviews the literature on the clinical application of LACR. **Study Design** Literature review. **Methods** A MEDLINE literature search was performed on LACR combined with cross-referencing. The period of search was 1993 to 2014. Search terms used were: laser, cartilage reshaping, protruding ears, LACR. **Results** Only seven clinical studies using three different wavelengths were found in the literature: 1,064 nm (Nd:YAG), 10,600 nm (CO₂), and 1540 nm (Er:Glass). Clinical outcomes, laser wavelength and parameters, and patient satisfaction are discussed in each case. **Conclusions** The success rate for ear reshaping achieved with LACR appears promising. The use of this noninvasive technique will increase in the near future. **Level of Evidence** Laryngoscope, 125:2067-2071, 2015

General information

Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: Frontier Photonics, CNRS, Université de Bordeaux, ICMCB, Hannover Medical School, Department of Plastic Surgery, Private Hospital, French Institute of Health and Medical Research U703, Univ Lille Nord de France

Contributors: Leclère, F. M., Vogt, P. M., Casoli, V., Vlachos, S., Mordon, S.

Number of pages: 5

Pages: 2067-2071

Publication date: 1 Sep 2015

Peer-reviewed: Yes

Publication information

Journal: LARYNGOSCOPE

Volume: 125

Issue number: 9

ISSN (Print): 0023-852X

Ratings:

Scopus rating (2015): CiteScore 4 SJR 1.365 SNIP 1.457

Original language: English

ASJC Scopus subject areas: Otorhinolaryngology, Medicine(all)

Keywords: Laser, laser-assisted cartilage reshaping, protruding ears

DOIs:

10.1002/lary.25260

URLs:

<http://www.scopus.com/inward/record.url?scp=84939773468&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84939773468

Research output: Contribution to journal › Review Article › Scientific › peer-review

Computed tomography findings after endoscopic sinus surgery with preserving or enlarging maxillary sinus ostium surgery

Endoscopic sinus surgery (ESS) is the main surgical approach in the treatment of chronic rhinosinusitis (CRS) after failure of medical treatment. ESS is based on the theory that obstruction of the maxillary sinus ostium is mainly behind the pathogenesis of CRS. Controversy remains concerning the enlargement of the natural maxillary sinus ostium. The aim of this study was to compare computed tomography (CT) findings after preservation or enlargement of the maxillary sinus ostium. Thirty patients with non-polypous CRS underwent randomized endoscopic sinus surgery with uncinectomy on one side and additional middle meatal antrostomy on the other side. Lund-Mackay (LM) scores and the ostium diameters were analysed from CT scans taken preoperatively and nine months postoperatively, and were used for comparison of the two operative techniques. In addition, the correlation between CT findings and subjective outcomes was studied. Comparison of the preoperative and postoperative CT scans revealed that significant reduction of LM score was achieved on both sides, regardless of the type of procedure performed. The postoperative area of the ostium remained significantly larger on the antrostomy side compared to the uncinectomy side. A large maxillary sinus ostium size seems to associate with lower postoperative LM score, but does not seem to provide superior symptom relief.

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Biomedical Engineering, Integrated Technologies for Tissue Engineering Research (ITTE), Päijät-Häme Central Hospital, Department of Otorhinolaryngology, Medical Imaging Centre, Tampere University Hospital, Mikkeli Central Hospital, Helsinki University Central Hospital

Contributors: Myller, J., Dastidar, P., Torkkeli, T., Rautiainen, M., Toppila-Salmi, S.

Number of pages: 1

Pages: 9

Publication date: 2011

Peer-reviewed: Yes

Publication information

Journal: RHINOLOGY

Volume: 49

Issue number: 4

ISSN (Print): 0300-0729

Ratings:

Scopus rating (2011): CiteScore 2.1 SJR 0.675 SNIP 0.995

Original language: English

ASJC Scopus subject areas: Otorhinolaryngology

Keywords: Chronic rhinosinusitis, Computed tomography, Endoscopic sinus surgery, Lund- Mackay score

DOIs:

10.4193/Rhino10.111

URLs:

<http://www.scopus.com/inward/record.url?scp=80054680214&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 80054680214

Research output: Contribution to journal › Article › Scientific › peer-review

Position paper from the IBRA Symposium on Surgery of the Head - The 2nd International Symposium for Condylar Fracture Osteosynthesis, Marseille, France 2012

Background This is a position paper from the 2nd International Bone Research Association (IBRA) Symposium for Condylar Fracture Osteosynthesis 2012 was held at Marseille, succeeding the first congress in Strasbourg, France, in 2007. The goal of this IBRA symposium and this paper was to evaluate current trends and potential changes of treatment strategies for mandibular condylar fractures, which remain controversial over the past decades. **Methods** Using a cross-sectional study design, we enrolled the consensus based on the panel of experts and participants in the IBRA Symposium 2012. The outcomes of interest were the panel and electronic votes on management of condylar base, neck and head fractures, and panel votes on endoscopic and paediatric condylar fractures. Appropriate descriptive and univariate statistics were used.

Results The consensus derived from 14 experts and 41 participant surgeons, using 12 case scenarios and 27 statements. The experts and participants had similar decision on the treatment of condylar base, neck and head fractures, as well as similar opinion on complications of condylar fracture osteosynthesis. They had a parallel agreement on using open reduction with internal fixation (ORIF) as treatment of choice for condylar base and neck fractures in adults. Endoscopic approaches should be considered for selected cases, such as condylar base fractures with lateral displacement. There was also a growing tendency to perform ORIF in condylar head fractures. The experts also agreed to treat children (>12 years old) in the same way as adults and to consider open reduction in severely displaced and dislocated fractures even in younger children. Nevertheless, non-surgical treatment should be the first choice for children

Conclusions The experts and participating surgeons had comparable opinion on management of condylar fractures and complications of ORIF. Compared to the first Condylar Fracture Symposium 2007 in Strasbourg, ORIF may now be considered as the gold standard for both condylar base and neck fractures with displacement and dislocation. Although ORIF in condylar head fractures in adults and condylar fractures in children with mixed dentition is highly recommended, but this recommendation requires further investigations.

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), University Hospital of Marburg, Aix-Marseille Univ, Amiens-Picardie University Medical Centre, Technical University (TU), Lille University Hospital - CHRU, São Paulo State University, North Hospital, Royal Hospital for Sick Children Glasgow, University Medical Centre of Besançon, University Hospital Basel, Tampere University Hospital, S. Maria Hospital, Geneva University Hospital, University Medical Centre of Strasbourg

Contributors: Neff, A., Chossegros, C., Blanc, J. L., Champsaur, P., Cheynet, F., Devauchelle, B., Eckelt, U., Ferri, J., Gabrielli, M. F. R., Guyot, L., Koppel, D. A., Meyer, C., Müller, B., Peltomäki, T., Spallaccia, F., Varoquaux, A., Wilk, A., Pitak-Arnop, P.

Number of pages: 16
Pages: 1234-1249
Publication date: 1 Oct 2014
Peer-reviewed: Yes

Publication information

Journal: Journal of Cranio-Maxillofacial Surgery

Volume: 42

Issue number: 7

ISSN (Print): 1010-5182

Ratings:

Scopus rating (2014): CiteScore 3.2 SJR 1.436 SNIP 2.055

Original language: English

ASJC Scopus subject areas: Surgery, Oral Surgery, Otorhinolaryngology

Keywords: Condylar fracture, Consensus, Osteosynthesis, Paediatric fractures, Position paper

DOIs:

10.1016/j.jcms.2014.03.005

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<http://www.scopus.com/inward/record.url?scp=84908253298&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84908253298

Research output: Contribution to journal > Article > Scientific > peer-review

The effect of adenoidectomy on occlusal development and nasal cavity volume in children with recurrent middle ear infection

Objectives: The aim of the study was to examine the effect of adenoidectomy on occlusal/dentoalveolar development and nasal cavity volume in children who underwent tympanostomy tube insertion with or without adenoidectomy due to recurrent episodes of middle ear infection. **Methods:** This prospective controlled study consisted of two randomly allocated treatment groups of children, younger than 2 years, who had undergone more than 3-5 events of middle ear infection during the last 6 months or 4-6 events during the last year. At the mean age of 17 months tympanostomy tube placement without adenoidectomy (Group I, n= 63) tympanostomy tube placement with adenoidectomy (Group II, n= 74) was performed. At the age of 5 years 41 children of the original Group I (14 females, 27 males, mean age 5.2 yrs, SD 0.17) and 59 children of the original Group II (17 females, 42 males, mean age 5.2 yrs, SD 0.18) participated in the re-examination, which included clinical orthodontic examination defining morphological and functional craniofacial status and occlusal bite index to measure upper dental arch dimensions. Acoustic rhinometry and anterior rhinomanometry was made by otorhinolaryngologist at the same day. **Results:** No statistically significant differences were found between the groups in the frequencies of morphological or functional characteristics or upper dental arch measurements or in the minimal cross-sectional areas or inspiratory nasal airway resistance measurements. **Conclusion:** Combining adenoidectomy with tympanostomy tube insertion in the treatment of recurrent middle ear infection at an early age (under the age of 2 years) does not seem to make any difference in occlusal development in primary dentition at the age of 5 years as compared to tympanostomy tube insertion only. Since adenoid size was not evaluated, the findings do not allow interpretation that hypertrophic adenoids should not be removed in children with continuous mouth breathing or sleep disordered breathing.

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Satakunta Central Hospital, Department of Otorhinolaryngology, Science Centre, University of Turku, School of Management (JKK)

Contributors: Niemi, P., Numminen, J., Rautiainen, M., Helminen, M., Vinkka-Puhakka, H., Peltomäki, T.

Number of pages: 5

Pages: 2115-2119

Publication date: 1 Dec 2015

Peer-reviewed: Yes

Publication information

Journal: INTERNATIONAL JOURNAL OF PEDIATRIC OTORHINOLARYNGOLOGY

Volume: 79

Issue number: 12

ISSN (Print): 0165-5876

Ratings:

Scopus rating (2015): CiteScore 2.2 SJR 0.707 SNIP 1.007

Original language: English

ASJC Scopus subject areas: Otorhinolaryngology, Pediatrics, Perinatology, and Child Health, Medicine(all)

Keywords: Adenoidectomy, Middle ear infection, Occlusal development, Primary dentition, Tympanostomy tube

DOIs:

10.1016/j.ijporl.2015.09.024

URLs:

<http://www.scopus.com/inward/record.url?scp=84955211318&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84955211318

Research output: Contribution to journal > Article > Scientific > peer-review

Retrospective analysis of a combined endoscopic and transcutaneous technique for the management of parotid salivary gland stones

Sialendoscopy is used in the diagnosis and treatment of various symptoms relating to the salivary gland, e.g. chronic swelling or obstruction and inflammation of the salivary duct. Small intraductal stones can be removed with various instruments during sialendoscopy, whereas larger ones can be fragmented with extracorporeal shockwave lithotripsy or laser. However, 5-10% of the patients with parotid stones cannot be treated with these methods. In patients with large impacted stones or stones in a hilus area, a combined endoscopic and transcutaneous technique can be employed. The stone is approached endoscopically, a skin flap is raised over or a small incision is made through the illuminated area, and the stone is removed by an external route with minimal morbidity. This retrospective study analysed the cases of 8 patients treated using the combined technique, 6 of whom became symptom free. Superficial parotidectomy was performed in 1 patient. No complications were observed, and ductal stents were not used. The average diameter of the stones was 7.6 mm (range 7.0-10.2). The combined technique is recommended for the removal of large and impacted intraductal stones in the parotid gland. No major complications have been reported.

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital, Satakunta Central Hospital, University of Tampere, Medical School

Contributors: Numminen, J., Sillanpää, S., Virtanen, J., Sipilä, M., Rautiainen, M.

Number of pages: 6

Pages: 282-287

Publication date: 20 Apr 2014

Peer-reviewed: Yes

Publication information

Journal: ORL: JOURNAL FOR OTO: RHINO: LARYNGOLOGY AND ITS RELATED SPECIALTIES

Volume: 76

Issue number: 5

ISSN (Print): 0301-1569

Ratings:

Scopus rating (2014): CiteScore 1.6 SJR 0.487 SNIP 0.671

Original language: English

ASJC Scopus subject areas: Otorhinolaryngology, Medicine(all)

Keywords: Combined approach, Parotid gland, Sialendoscopy, Sialolithiasis, Stenting

DOIs:

10.1159/000368719

URLs:

<http://www.scopus.com/inward/record.url?scp=84917740263&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84917740263

Research output: Contribution to journal > Article > Scientific > peer-review

Accuracy of linear intraoral measurements using cone beam CT and multidetector CT: A tale of two CTs

The aim was to compare the accuracy of linear bone measurements of cone beam CT (CBCT) with multidetector CT (MDCT) and validate intraoral soft-tissue measurements in CBCT. Methods: Comparable views of CBCT and MDCT were obtained from eight intact cadaveric heads. The anatomical positions of the gingival margin and the buccal alveolar bone ridge were determined. Image measurements (CBCT/MDCT) were performed upon multiplanar reformatted data sets and compared with the anatomical measurements; the number of non-assessable sites (NASs) was evaluated. Results: Radiological measurements were accurate with a mean difference from anatomical measurements of 0.14mm (CBCT) and 0.23mm (MDCT). These differences were statistically not significant, but the limits of agreement for bone measurements were broader in MDCT (21.35 mm; 1.82 mm) than in CBCT (-0.93 mm; 1.21 mm). The limits of agreement for soft tissue measurements in CBCT were smaller (-0.77 mm; 1.07 mm), indicating a slightly higher accuracy. More NASs occurred in MDCT (14.5%) than in CBCT (8.3%).

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), University of Zurich, Tampere University Hospital, University Children's Hospital, University Hospital Zürich

Contributors: Patcas, R., Markic, G., Müller, L., Ullrich, O., Peltomäki, T., Kellenberger, C. J., Karlo, C. A.

Number of pages: 8

Pages: 637-644

Publication date: 1 Dec 2012

Peer-reviewed: Yes

Publication information

Journal: Dentomaxillofacial Radiology

Volume: 41

Issue number: 8

ISSN (Print): 0250-832X

Ratings:

Scopus rating (2012): CiteScore 2.4 SJR 0.907 SNIP 1.349

Original language: English

ASJC Scopus subject areas: Radiology Nuclear Medicine and imaging, Otorhinolaryngology, Dentistry(all)

Keywords: Accuracy, CBCT, Computed tomography, Image quality, Soft tissue

DOIs:

10.1259/dmfr/21152480

URLs:

<http://www.scopus.com/inward/record.url?scp=84870904713&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84870904713

Research output: Contribution to journal › Article › Scientific › peer-review

Surgery first - protocols and techniques for orthodontic treatment

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital

Contributors: Peltomäki, T.

Number of pages: 1

Pages: 1

Publication date: 12 Dec 2014

Peer-reviewed: Yes

Publication information

Journal: HEAD & FACE MEDICINE

Volume: 10

Original language: English

ASJC Scopus subject areas: Otorhinolaryngology, Dentistry(all), Clinical Neurology

DOIs:

10.1186/1746-160X-10-S1-O2

URLs:

<http://www.scopus.com/inward/record.url?scp=84928733828&partnerID=8YFLogxK> (Link to publication in Scopus)

Research output: Contribution to journal › Article › Scientific › peer-review

Segmented therapies in orthodontics

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital

Contributors: Peltomäki, T.

Number of pages: 1

Pages: 1

Publication date: 12 Dec 2014

Peer-reviewed: Yes

Publication information

Journal: HEAD & FACE MEDICINE

Volume: 10

Original language: English

ASJC Scopus subject areas: Otorhinolaryngology, Dentistry(all), Clinical Neurology

DOIs:

10.1186/1746-160X-10-S1-O5

URLs:

<http://www.scopus.com/inward/record.url?scp=84928731458&partnerID=8YFLogxK> (Link to publication in Scopus)

Research output: Contribution to journal › Article › Scientific › peer-review

The Experience of Treating Drooling with Repeated Botulinum Toxin Injections

Botulinum toxin A (BTX-A) injections to the salivary glands are effective in the treatment of drooling, and complications are rare. However, there are only a few previous reports on the long-term use of BTX-A injections. This study retrospectively analyzes our experience of treating drooling with repeated BTX-A injections in patients with neurodegenerative diseases. All patients who received repeated BTX-A injections to the submandibular glands at Tampere University Hospital in 2004-2013 were included in the analysis. Six patients, aged from 6 to 21 years, were included in the study, and a total of 41 bilateral BTX-A injections were administered to their submandibular glands. The average number of injections per patient was 6 (range: 3-11). The average interval between the injections was 9.8 months (range: 4-18), and 95% (39/41) of the injections were performed with good response. The complication rate of the BTX-A injections was 2.4% (1/41), since one of the patients had swallowing problems after an injection. BTX-A injections to the submandibular glands are effective and have a low morbidity rate, and repeated injections can be recommended as long-term treatment of drooling.

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital

Contributors: Sillanpää, S., Sipilä, M., Numminen, J., Rautiainen, M.

Number of pages: 6

Pages: 333-338

Publication date: 1 Nov 2015

Peer-reviewed: Yes

Publication information

Journal: ORL: JOURNAL FOR OTO: RHINO: LARYNGOLOGY AND ITS RELATED SPECIALTIES

Volume: 77

Issue number: 6

ISSN (Print): 0301-1569

Ratings:

Scopus rating (2015): CiteScore 1.6 SJR 0.577 SNIP 0.6

Original language: English

ASJC Scopus subject areas: Otorhinolaryngology

Keywords: Adverse effect, Botulinum toxin, Drooling, Salivary gland, Sialorrhea

DOIs:

10.1159/000439175

URLs:

<http://www.scopus.com/inward/record.url?scp=84942636141&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84942636141

Research output: Contribution to journal › Article › Scientific › peer-review

Balloon dilation of the cartilaginous portion of the Eustachian tube

Objective. Studies of balloon Eustachian tuboplasty (BET) have shown encouraging results in small series with short follow-ups. Our pilot study suggested that patients with protracted otitis media with effusion (OME) or atelectasis of the tympanic membrane (TM) could benefit from BET.

Study Design. A prospective study where subjects act as their own controls. Patients from the pilot study and additional cases were enrolled in this cohort with long-term follow-up.

Setting. Regional Academic Center.

Subjects and Methods. Out of 80 patients who underwent BET, 41 consecutive Eustachian tube (ET) operations were included. Subjects' inclusion criteria were OME and/or TM atelectasis, type B or C tympanograms, and inability to inflate their middle ears by Valsalva maneuver. All patients had longstanding ET dysfunction relieved only by repeated tympanostomies. Outcomes included ability to perform a Valsalva maneuver, audiometry, tympanometry, videoendoscopy of the ET with mucosal inflammation rating scores, and otomicroscopy.

Results. All cases were dilated successfully, without significant complications. Mean follow-up was 2.5 years (range, 1.5-4.2 years). Eighty percent (33/41) could do a Valsalva maneuver postoperatively; none of these ears required new tympanostomy tubes and subjective symptoms were relieved. Tympanometry results showed overall improvement. Nine patients had persistent perforations and 3 declined removal of the tube. Subjective symptoms were not relieved for 10%

(4/41).

Conclusion. The results show that BET can effectively improve ET function in ears with OME or atelectasis. The procedure is well tolerated and without significant complications. The follow-up continues and we are investigating possible reasons for failures.

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Rikshospitalet-Radiumhospitalet HF, Harvard Medical School

Contributors: Silvola, J., Kivekäs, I., Poe, D. S.

Number of pages: 6

Pages: 125-130

Publication date: 27 Jul 2014

Peer-reviewed: Yes

Publication information

Journal: OTOLARYNGOLOGY: HEAD AND NECK SURGERY

Volume: 151

Issue number: 1

ISSN (Print): 0194-5998

Ratings:

Scopus rating (2014): CiteScore 3.2 SJR 1.176 SNIP 1.341

Original language: English

ASJC Scopus subject areas: Otorhinolaryngology, Surgery

Keywords: balloon dilation, Eustachian tube, secretory otitis media

DOIs:

10.1177/0194599814529538

URLs:

<http://www.scopus.com/inward/record.url?scp=84921649937&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84921649937

Research output: Contribution to journal > Article > Scientific > peer-review

Upper airway changes in Pierre Robin sequence from childhood to adulthood

Structured Abstract: Objectives: To investigate pharyngeal airway changes in patients with Pierre Robin sequence (PRS) longitudinally from childhood to adulthood. Setting and Sample Population: Cleft Lip and Palate Unit, Clinic of Orthodontics, University of Zurich. Twenty-four patients born between 1970 and 1990 with non-syndromic PRS. Materials and Methods: Lateral cephalograms at age 5 (T1), 10 (T2), 15 (T3) and 20 (T4) years were available. Variables describing pharyngeal airway dimensions, soft palate morphology, tongue and hyoid position, skeletal morphology and head posture were assessed. Results: A significant increase in nasopharyngeal depth was found over the entire observation period (T1 10.7 to T4 19.1 mm, $p < 0.001$), especially between T2 and T3 (change 3.8 mm, $p < 0.001$), and was mainly due to adenoid recession ($r = -0.75$, $p < 0.001$; variation explained by 56%). Increase in velopharyngeal depth mainly took place between T3 and T4 (change 2.3 mm, $p < 0.01$). It was due to more anterior tongue posture ($r = 0.65$, $p < 0.001$; 42.5% of variation explained), in turn allowing the soft palate to take a more vertical position ($r = -0.52$, $p < 0.001$). Increase in oropharyngeal depth was associated with head extension and anterior mandibular positioning (36% of variation explained). However, significance was not reached (T1 8.3 to T4 9.8 mm, $p > 0.05$). Conclusions: Upper airway dimensions in children with PRS improve with time, except for the oropharyngeal airway. Despite large interindividual variation, the mean remained in the lower reaches of normality described in other studies. Thus, further research should investigate the prevalence of obstructive sleep apnoea in adults with PRS.

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), University of Zurich

Contributors: Staudt, C. B., Gnoinski, W. M., Peltomäki, T.

Number of pages: 12

Pages: 202-213

Publication date: Nov 2013

Peer-reviewed: Yes

Publication information

Journal: ORTHODONTICS AND CRANIOFACIAL RESEARCH

Volume: 16

Issue number: 4

ISSN (Print): 1601-6335

Ratings:

Scopus rating (2013): CiteScore 3 SJR 1.309 SNIP 1.462

Original language: English

ASJC Scopus subject areas: Orthodontics, Oral Surgery, Otorhinolaryngology, Surgery

Keywords: Airway, Cephalometry, Child, Longitudinal, Pierre Robinsequence

DOIs:

10.1111/ocr.12019

URLs:

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Source: Scopus

Source ID: 84885058542

Research output: Contribution to journal > Article > Scientific > peer-review

Image-guided, navigation-assisted Relieva Stratus MicroFlow Spacer insertion into the ethmoid sinus

Anatomical complexity presents the main challenge in the administration of topical corticosteroid therapy to the paranasal sinus mucosa. This often leads to suboptimal drug delivery due to low concentrations of the therapeutic agent to the intended target area. The Relieva Stratus™ MicroFlow Spacer (Relieva Stratus) is a drug-eluting stent that is temporarily implanted into the ethmoid sinus. The reservoir of the stent is filled with triamcinolone acetonide, which is then slowly released from the device into the ethmoid sinus mucosa. The Relieva Stratus provides local and targeted delivery of the anti-inflammatory agent to the diseased mucosa. This minimally invasive implant is an option when treating ethmoid sinusitis. From January 2011 to November 2013, a total of 52 Relieva Stratus implantations into the ethmoidal cells were performed at the Department of Ear and Oral Diseases at Tampere University Hospital, Finland. C-arm fluoroscopy guidance was employed for 26 sinuses (13 patients) and optical image-guided surgery (IGS)-assisted insertions were performed on another 26 sinuses (13 patients). The accuracy of fluoroscopic insertion is not optimal, but this method is accurate enough to prevent the violation of the skull base and lamina papyracea. IGS enables the precise treatment of the diseased cells. From a technical perspective, IGS-guided insertion is a faster, safer and more exact procedure that guarantees the optimal positioning and efficacy of the implant. Moreover, IGS guidance does not entail the use of ionizing radiation.

General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital

Contributors: Taulu, R., Numminen, J., Bizaki, A., Rautiainen, M.

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In vitro detection of common rhinosinusitis bacteria by the eNose utilising differential mobility spectrometry

Acute rhinosinusitis (ARS) is a sudden, symptomatic inflammation of the nasal and paranasal mucosa. It is usually caused by respiratory virus infection, but bacteria complicate for a small number of ARS patients. The differential diagnostics between viral and bacterial pathogens is difficult and currently no rapid methodology exists, so antibiotics are overprescribed. The electronic nose (eNose) has shown the ability to detect diseases from gas mixtures. Differential mobility spectrometry (DMS) is a next-generation device that can separate ions based on their different mobility in high

and low electric fields. Five common rhinosinusitis bacteria (*Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*) were analysed in vitro with DMS. Classification was done using linear discriminant analysis (LDA) and k-nearest neighbour (KNN). The results were validated using leave-one-out cross-validation and separate train and test sets. With the latter, 77% of the bacteria were classified correctly with LDA. The comparative figure with KNN was 79%. In one train-test set, *P. aeruginosa* was excluded and the four most common ARS bacteria were analysed with LDA and KNN; the correct classification rate was 83 and 85%, respectively. DMS has shown its potential in detecting rhinosinusitis bacteria in vitro. The applicability of DMS needs to be studied with rhinosinusitis patients.

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