scaffolds were coated with a novel polymer based therapy (enabled by RAFT polymerisation) aimed at transfection and expression of the growth factor BMP-2. Bone regeneration and vasculogenesis were evaluated using μCT-Angiography before and after decalcification and histomorphometry. 5 μm sections were subjected to Eosin and Haematoxylin staining and immunostained.

Findings: At a resolution of 8 μm, it was possible to determine 3D vessel (vascular volume, vessel thickness and vessel thickness distribution; possible from about 20 μm vessel diameter) and bone parameters. A good correlation to histomorphometry was achieved ($p < 0,05$).

Conclusion: μCT can accurately reproduce the vascular morphology, and can replace histomorphometry for future studies at the supracellular level. On a submicrometer cellular level, histology remains the gold standard.

https://doi.org/10.1016/j.ijom.2019.03.477

Same day cancellation of operating theatre lists, is there a room for improvement?

R. Boyapati*, J. Mehta, T. Thind

Queen Victoria Hospital, East Grinstead

Background: Cancellation of operations on the day of operation causes considerable anxiety to the patients and also causes significant strain on the already overstretched resources.

Objectives: The quantification of the cancellations can look into the areas where the improvements can be made to improve the operating theatre efficiency.

Methods: All the patients who were listed for elective operations at Queen Victoria Hospital, East Grinstead, West Sussex between 1st January 2017 to 31st December 2017 were identified from the operating theatre registers. Patients who had the procedures cancelled on the day were retrospectively identified from the computer database. The reason for the cancellations were tabulated into a) patient factors b) Hospital factors c) miscellaneous factors d) operation no longer necessary.

Findings: 11000 operations were performed in one year between April 2017- March 2018. About 10% of patients were cancelled on the day of operation. This caused considerable strain on the health service which needs done of these patients to rebook for the operations. 25% of the cancelled patients didn't need the operations.

Conclusion: There is clearly a room for improvement to reduce the number of cancellations as these slots could have been used by the people in need. Cancelled patients due to hospital factors need re distribution if the anaesthetic staff rota. Communicating with patients one or two days before the appointments might reduce the chance of cancellation due to patient factors.

https://doi.org/10.1016/j.ijom.2019.03.478

Cranial reconstruction- syndrome of trephined, 3D navigation, customized expanders- a retrospective review of practice

S.R. Chandra

University of Nebraska Medical Center

Background: Literature in the nuances of calvarial subunit reconstruction in post cranioplasty and 'syndrome of the trephined' is sparse. Tissue expansion is adjunct to scalp and calvarial reconstruction. Free flaps may not be ideal in all instances as documented in our cohort.

Objectives: Objective of this presentation is to highlight the complexity and details of the reconstruction in the composite tissue depleted wounds, sequelae of multiple interventions. The calvarial subunits of maxillofacial skeleton and needs of composite defects with dural exposure, polymicrobial contamination etc. are presented.

Methods: Retrospective review of 5 year cranioplasty surgical practice of 24 cases have been treated with partial to total composite skull defects. We review the indications, treatment planning, operative techniques, and complications of the procedures. The role of tissue expanders in scalp reconstruction, advantages and its limitation is highlighted here. We also present pedicled tissue coverage, negative pressure wound therapy and vascular free flaps along with tissue expanders as adjunct for scalp and skull reconstruction.

Findings: Indications were syndrome of trephined, missile injury, vascular, oncological, traumatic reconstruction and revisions, hidradenitis, cranioplasty defects, osteoradionecrosis. Complications were infection, skin atrophy ulceration, vascular compromise, expander punctures, capsular contracture, hematomas, reservoir switching, ventriculoperitonial shunt, management, cortical resorption. We summarize paradigms for ideal volume, expansion, type of port and location. In large calvarial reconstructions rapid expansion was not tolerated, weekly expansion is not ideal.

Conclusion: Tissue expansion is a valuable aid with or without vascular free tissue. Navigation and custom tissue expanders are our treatment options. Knowledge of rare implications and modifications are essential.

https://doi.org/10.1016/j.ijom.2019.03.479

Force and deformation stresses in "L" type 1.5 system customized and 1.7 system non-customized plates during simulation of advancement LeFort 1 osteotomy

B.C. Lima, V.F. Ramos, L.A.P.F. Pinto

Centro de Tratamento da Face, Rio de Janeiro, Brazil

Background: Orthognathic surgery needs to provide the best stability possible, with the surgeon knowing that planning will be achieved, causing better results.

Objectives: The aim of this study was to evaluate the distribution of deformation stresses in customized and non-customized plates during simulated advancement LeFort osteotomy, by means of the finite element method (Ramos et al., 2017).

Methods: The customized plate (Traumec) was developed with advancement of 4.75 mm, machined 1.5 "L" type, and six screws for the anterior and posterior region. Non-customized plates (Stryker 1.7 "L" type with six screws for the anterior and posterior region) was used for comparison. Three 5 mm screws in each pillar (canine and zygomatic) and other three in the maxilla segment were placed for each plate by both Traumec and Striker. It was evaluated dislocation pikes between the surfaces of the osteotomy and the tension pikes over the screws and over the plates under anterior and posterior load.

Findings: All plates showed the same dislocation under posterior load (0,005 mm). Striker showed higher dislocation under anterior load (0,638 mm) then Traumec plates (0,417 mm). The tension pike over the screws under anterior load was biggest in the Striker plate (460,2 MPa) and under posterior load, bigger in Traumec plates (30,5 MPa). Stryker plates showed smaller tension pikes under anterior (485,0 compared to 826,7 MPa) and posterior loads (26,0 over 44,8 MPa).

Conclusion: The Traumec plate showed better results for Advancement Lefort Osteotomy, once it gave better fixation stability, even being thinner the Striker plates.

https://doi.org/10.1016/j.ijom.2019.03.480

Clinical applications of a high-definition three-dimensional exoscope in maxillo facial surgery

S. Crimi*, A. Tarsitano, F. Esposito, A. Bianchi, C. Marchetti, F.S. De Ponte

University of Catania, Sicily, Italy; University of Messina, Sicily, Italy; University of Bologna, Emilia Romagna, Italy

Background: Optimal vision, ergonomics, illumination, exposure, and magnification are important factors contributing to the achievement of good results during Craniomaxillofacial interventions. The operating microscope and the endoscope have partially filled the gap between the need for good surgical vision and maintenance of a comfortable posture. Recently, a new technology called video-assisted telescope operating monitor or exoscope has been used in other surgery. The main drawback with previous prototypes was lack of stereopsis. We present a clinical report of 15 CMF procedures performed using the VITOM.

Objectives: The aim of our study was to assess the VITOM system as a valid vision tool during craniomaxillofacial procedures. We also describe the applications for surgical operations, advantages, and pitfalls. Intraoperative patient documentation and great education possibilities at low cost are achieved.

Methods: 15 different Maxillo Facial Surgery procedures were performed with VITOM exoscope. Instrument handling, repositioning of the exoscope, image control, adjustment of magnification and focal length, depth perception, image quality, illumination, and comfort level of posture were assessed. The telescope was maintained over the surgical field and a video monitor was placed at 2 m from the surgeons.

Findings: The illumination of the surgical field was judged excellent. Surgeons had the opportunity to operate with an unprecedented magnified vision, performing the surgical result. VITOM has overcome the lack of stereopsis, a major previous drawback. It has many advantages regarding ergonomics, versatility, and depth of field compared with the operating microscope, but the holder arm and the mechanism of repositioning, refocusing, and magnification needs to be ameliorated. All the members of the operating theatre were able to follow each step of the operation.

Conclusion: VITOM technology may become a diffuse method.

https://doi.org/10.1016/j.ijom.2019.03.481

Application of concentrated growth factors CD34+/CD45 on the 3D printed alginate scaffolds an in vitro study

N. Doan*, P. Reher, G. Wang, L. Truong, S. Hamlet, J. Doan, D. Ipe, S. Kumar, N.T. Nguyen

The University of Queensland, Brisbane, Australia

Background: Bone regeneration continues to be an important clinical task in regenerative medicine.

Objectives: This research evaluated the mineralized tissue forming potential of 3-D printed medical grade alginate constructs containing concentrated growth factors (CGF-CD34+/CD45).

Methods: 3-D printed medical grade alginate constructs containing patients 'blood (control) and concentrated growth factors (CGF-CD34+/CD45 as control) were prepared. Cells viability, osteogenic gene expression, mineralized tissue formation release in vitro, were assessed by fluorescence staining, RT-PCR, histological/μ-CT examination and ELISA respectively.

Findings: Compare with the control, 3-D printed medical grade alginate constructs containing concentrated growth factors (CGF-CD34+/CD45) did not adversely result in cell viability, and 3-D culture in osteogenic media showed better mineralized collagenous matrix formation after 6 weeks. After 4 weeks in vivo, 3-D printed medical grade alginate constructs containing concentrated growth factors (CGF-CD34+/CD45) formed significantly more volume (mm3) of vascularized bone-like tissue.

Conclusion: Compare to the control, 3-D printed medical grade alginate constructs containing concentrated growth factors (CGF-CD34+/CD45) offer a better constructive environment for bone tissue engineering by contributing more to mineralized tissue formation in vitro.

https://doi.org/10.1016/j.ijom.2019.03.482

Lateral orbitotomy with extended osteotomy: a new surgical approach for infratemporal fossa tumours

I. Elimairi*, A. Salah, A. Alnyal, B. Musa

The National Ribat University and Hospital, Khartoum, Sudan

Background: The Infratemporal Fossa (ITF) is a complex potential space. Tumours extending into or originating from the ITF are rare. It is recommended that ITF tumours are removed surgically as they are rarely radiosensitive. Removal of tumours from the ITF is often difficult because of limited surgical access. Division of zygomatic arch has proved useful for improving access but may cause damage to the facial nerve, pterygoid muscles, and vasculature. Other approaches have been described to improve surgical access. We experienced with great success Lateral Orbitotomy (LO) surgical approach with extended osteotomies to access the superior part of Infratemporal fossa and pterygomaxillary region with no need to section the Zygomatic arch.

Objectives: To access the ITF and posterior maxilla and to avoid extensive and time consuming dissection and division of the zygomatic arch.

Methods: Lateral orbitotomy with osteotomy was used to access the ITF and posterior maxilla in 13 patients presented with space occupying lesion extended into or originated from the ITF.

Findings: Improved access to the ITF and posterior maxilla were obtained with a lateral orbital osteotomy. However this left the zygomatic arch, overlying the tumour, undisturbed with no or minimal morbidity.

Conclusion: Use of the LO with osteotomy provides excellent access to the superior compartment of the ITF and posterior maxilla avoiding extensive dissection and sectioning of the zygomatic arch. Access to the more inferior part of the ITF would appear to be limited. In this situation access can be improved further if the endoscopic-assisted approach is combined.

https://doi.org/10.1016/j.ijom.2019.03.483