



Belgian Society of Oral &
Maxillo Facial Surgery
Head & Neck

BVMKA-HH / ABCOMF-TC SPRING MEETING 2025

Innovations in OMFS for clinical applications

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Saturday – 08h45: Welcome

Welcome

Voorjaarscongres - Congrès de mars

Dear colleagues,

This year's event is dedicated to Future Innovations in Maxillofacial Surgery, bringing together leading experts and professionals to explore the latest developments and emerging technologies that are transforming our field. From cutting-edge 3D technologies to advancements in regenerative medicine and regulatory updates, this congress offers a comprehensive look at the future of maxillofacial surgery.

We are honored to feature a distinguished panel of keynote speakers:

- **Andries CLINCKAERT:**
 - *Presenting the opportunity to assess our readiness for adopting AI-driven solutions in our field.*
- **Debby GAWLITTA:**
 - *Sharing her groundbreaking research on bio-inspired bone regeneration using cartilaginous tissues and osteoinductive materials for the treatment of palatal clefts.*
- **Bart VANDENBERGHE:**
 - *Drawing attention to the transformative potential of imaging innovations in achieving better clinical results and patient care.*
- **Renaat COOPMAN:**
 - *Discussing about practical organistorical challenges in surgical digitization.*

We encourage you to participate actively, engage in discussions, and connect with colleagues as we explore these exciting advancements together. This congress is not only an opportunity to learn but also a platform to collaborate and shape the future of our specialty.

Thank you for joining us. We look forward to an inspiring and forward-thinking day!

Yves GILON
President ABCOMFTC-BVMKAHH

Venue



*Sheraton Hotel - Brussels Airport
Luchthaven Brussel, 1930 Brussel*



Saturday March 22, 2025



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WIFI CODE



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Our Partners



PROGRAM



PART 1: MORNING SESSION

08h45 | Welcome

09h00 |

Perioperative Anticoagulation in Free Flap Surgery in Maxillofacial Surgery.

Author(s): Nikolaas Aelterman, P. Lejuste, B. dive, S. S-Karengera, T. Bourgeois, T. Dontaine, GHdC Charleroi

09h 10 |

The use of three iliac crest muscles for head and neck soft tissue reconstruction.

Author(s): Eléonore Fourneau, H. Crèvecoeur, F. Nsimba-Bimwala, UCL Namur - Site de Sainte-Elisabeth

09h20 |

Oral rehabilitation in poly-allergic and multi-systemic disease. Patient with cleft lip and palate and fibular free flap, with quad zygomatic implants.

Author(s): César Dauchot¹, C. Politis¹, C. Aubert², L. Evrard¹, ULB Hôpital Erasme¹, ULB HUDERF²

09h30 |

Rehabilitation of the atrophic edentulous maxilla with early loaded short implants: A new treatment concept.

Author(s): Luc Van Doorne^{1,2}, C. Croo³, J. Carbonez², C. Vanderstraeten², R. Coopman¹, University Hospital, Ghent¹, Private practice, Brugge², Private practice, Melle³

09h40 |

3D Finite Element Analysis of Biomechanical strains in Patients with Full Titanium Framework on Four Zygomatic Fixtures: Systematic review and clinical application.

Author(s): Antoine Yanni, I. Larabi, L. Evrard, ULB Hôpital Erasme

09h50 | Discussion

10h00 | Coffee

10h30 | Keynote: R. Coopman:

Practical Organististical Challenges in Surgical Digitization:
A centralised hospital-wide approach.

University Hospital, Ghent, Belgium

10h50 | Discussion

11h00 |

Reconstruction of Craniomaxillofacial Bone Defects with 3D-
Printed Bioceramic Implants.

Author(s): Maarten Verbist, J. Meeus, A. Van Mierlo, P-J. Verhelst, F. Van der Cruyssen, Y. Sun, E. Shaheen, R. Willaert, UZ Leuven

11h10 |

3D bone graft design for preprosthetic reconstruction of the jaw:
Presentation of 3D Work-Flow and Preliminary Results.

Author(s): Marvin D'Hondt, Y. Opdenakker, K. Borghgraef, B. De Cuyper, AZ Maria Middelaers Ghent

11h20 |

The Biomimetic Periosteum: A Revolution in Reconstructive
Strategies.

Author(s): Charlotte Bodet, M. Kilic, L. Groeneveldt, S. Systemans, Y. Gilon, CHU Liege, Belgium

11h30 |

Bone Tissue Engineering for Large Maxillofacial Bone Defects:
Enhancing Quality and Quantity with Growth Factors

Author(s): Lisanne Groeneveldt^{1,2}, Y. Gilon², Skeletal Biology and Engineering Research Center, KU Leuven, Leuven¹, CHU, University of Liege, Belgium².

11h40 | Discussion

11h50 | Keynote: Debby Gawlitta

Regenerative power of engineered hypertrophic cartilage tissues
to induce bone formation following in vivo implantation.

Associate Professor, Director Regenerative Medicine PhD program, GSLS Utrecht University, The Netherlands.

12h15 | Discussion

12h30 | Lunch

13h30 | Administrative session

PART 2: AFTERNOON SESSION

14h00 | Keynote: Bart Vandenberghe:

Navigating digital workflows and novel technologies in oral healthcare.

DDS, PhD, international lecturer, Advimago Training Center, Brussels, Belgium.

14h20 | Discussion

14h30 |

Questioning the Utility of X-Guide in Implantology: Insights from Experienced Surgeons.

Author(s): César Dauchot, P. Lejuste, B. Dive, T. Dontaine, Grand Hôpital de Charleroi

14h40 |

Computer-Assisted Navigation in Orthognathic Surgery.

Author(s): Szonja Tancredi, A. Yanni, C. Politis, F. Shall, L. Evrard, ULB-Hôpital Erasme

14h50 |

Real-Time 3D Intraoperative Accuracy Verification in Orthognathic Surgery Using Intraoperative CBCT:

Validation of IPS CaseDesigner and Comparison with Brainlab Elements - A Feasibility Study.

Author(s): Xander Jackers¹, G. De Fazio Renato^{1,5}, A. Diez-Fraile^{1,2}, J. Abeloos¹, T. De Backer^{1,4}, J. De Ceulaer^{1,4}, C. De Clercq¹, F. De Ketelaere³, M. Desmedt^{1,4}, P. Lamoral^{1,3}, K. Nagy¹, N. Neyt^{1,4}, K. Supply³, B. Veys^{1,3}, C. Spaas^{1,4}, G. Swennen¹, AZ MKA Sint-Jan Brugge¹, Clinical Research Scientist, Division of Maxillo-Facial Surgery², AZ Sint Jan Brugge, MKA AZ Sint-Lucas, Bruges³, ⁴MKA, AZ ZENO, Knokke, ⁵Division of Maxillo-Facial Surgery, Department of Neurosciences, Reproductive and Odontostomatological Sciences, University Federico II of Naples, Naples, Italy

15h00 |

Guided versus unguided All-on-4 implant placement: a retrospective study and future perspectives.

Author(s): Simon Corthals¹, A. Diez-Fraile^{1,2}, J. Abeloos¹, T. De Backer^{1,4}, J. De Ceulaer^{1,4}, C. De Clercq¹, F. De Ketelaere³, M. Desmedt^{1,4}, P. Lamoral^{1,3}, K. Nagy¹, N. Neyt^{1,4}, B. Veys^{1,3}, C. Spaas^{1,4}, G. Swennen¹, ¹MKA, AZ Sint-Jan Brugge, ²Clinical Research Scientist, Division of Maxillo-Facial Surgery, AZ Sint Jan Brugge, ³MKA, AZ Sint-Lucas, Bruges, ⁴MKA, AZ ZENO, Knokke, Belgium

15h10 | Discussion

15h20 | Coffee

15h50 | Keynote: Andries Clinckaert:

Improving data capture in surgery. CEO of Tiro.health
Practical Organizational Challenges in Surgical Digitization: A
centralised hospital-wide approach.

University Hospital, Ghent, Belgium

16h10 | Discussion

16h20 |

Development and Evaluation of a GPT4-Based Orofacial Pain
Clinical Decision Support System.

*Author(s): Charlotte Vueghs¹, H. Shakeri¹, T. Renton², F. Van der
Cruyssen^{1,3}, ¹MKA, University Hospitals Leuven, ²Department of Oral
Surgery, King's College London Dental Institute, London SE5 9RW, UK,
³OMFS-IMPACT Research Group, KU Leuven, Belgium*

16h30 |

Hedgehog pathway inhibitors, a new way of treating basal cell
carcinoma?

*Author(s): Olivia Maleux, K. Berquin, A. Bral, D. Gorlé, S. Kalantary, V.
Lenaerts, S. Ongena, R. Snel, VITAZ Hospital, Sint-Niklaas*

16h40 |

Carotid body paraganglioma – presentation, management and
pitfalls.

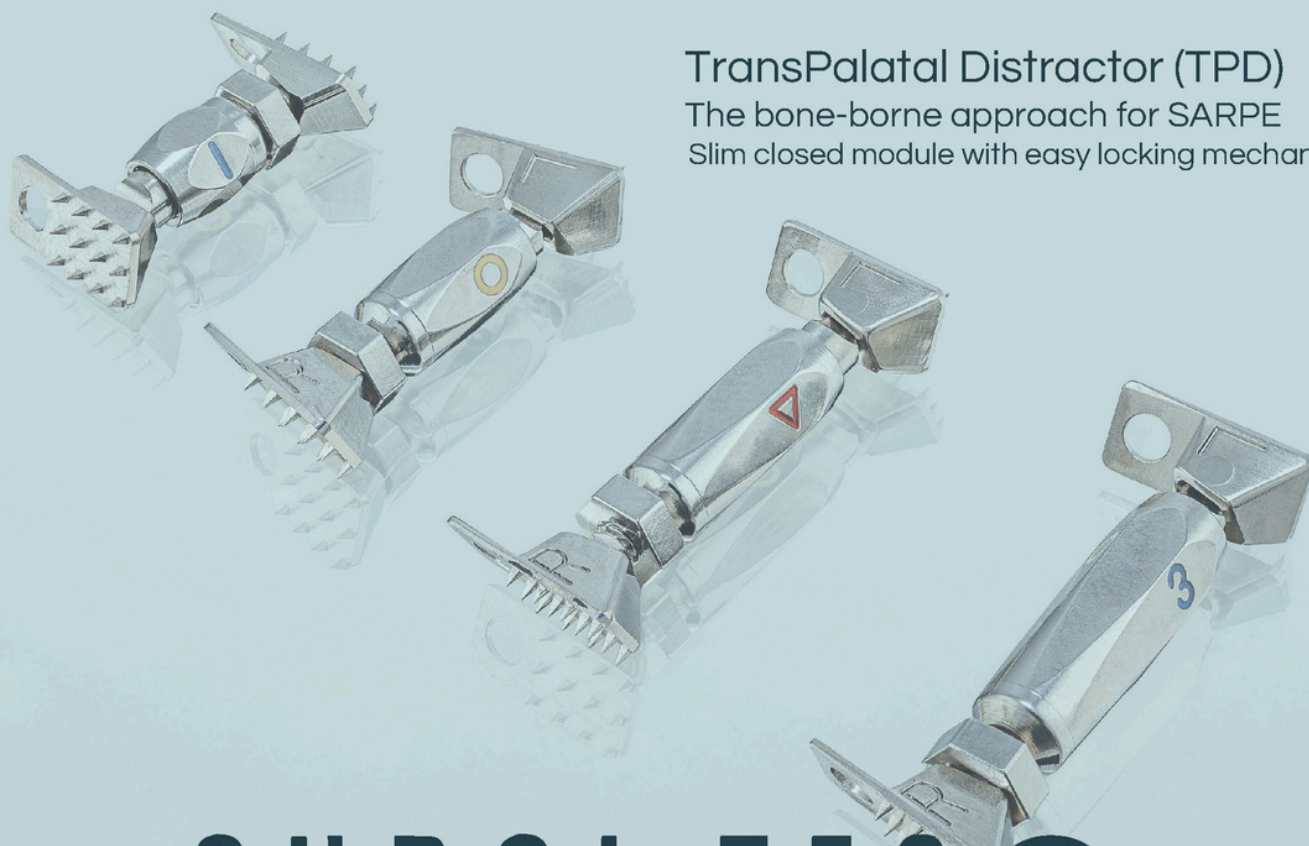
*Author(s): Johanna Van Butsele, J. Jacobs, J. Orye, B. Baerts, E. Henquet,
K. Grisar, B. Falter MKA Jessa ziekenhuis, Hoofd-halscentrum Sint-Trudo
ziekenhuis*

16h50 | The Effect of Pineapple Juice on Postoperative Outcomes
Following Wisdom Teeth Extraction: A Prospective Randomized
Controlled Trial.

*Author(s): Kobbe Vervaeke^{1,2}, E. Shaheen^{2,3}, F. De Brauwier¹, M. Dom¹,
J.T. Deferm¹, AZ Sint-Maarten, Mechelen¹, UZ Leuven², OMFS-IMPACT
research group S³*

17h00 | Discussion and closing remarks

17h15 | END



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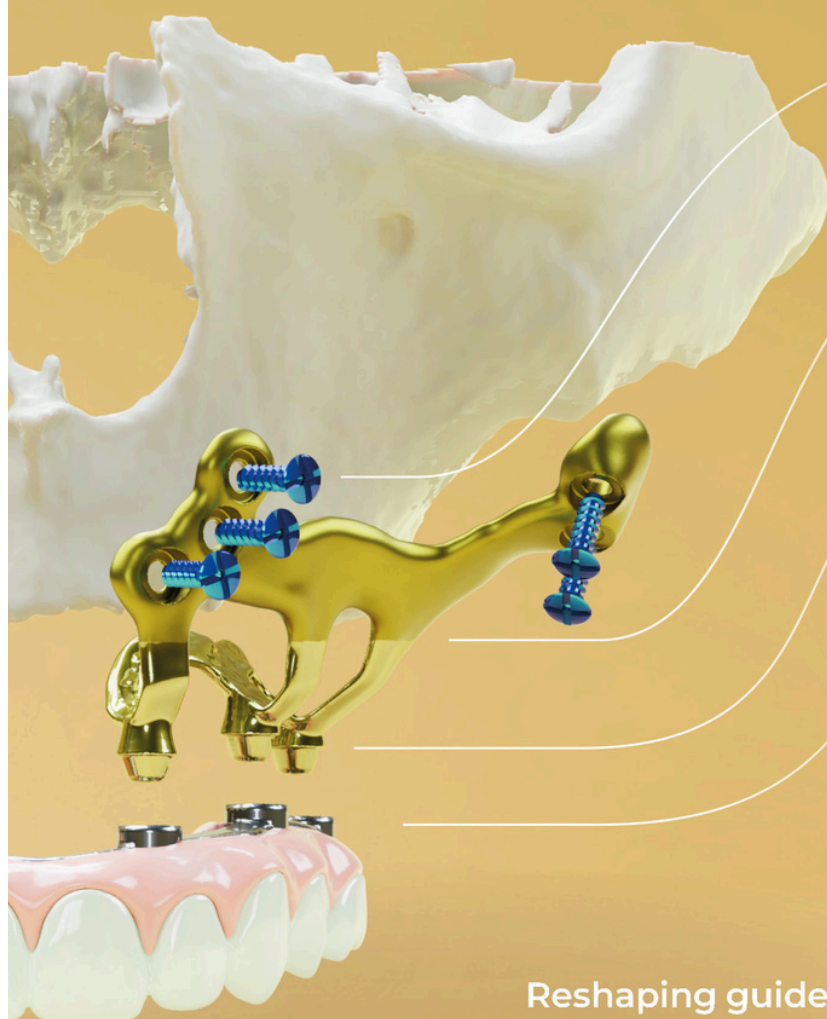
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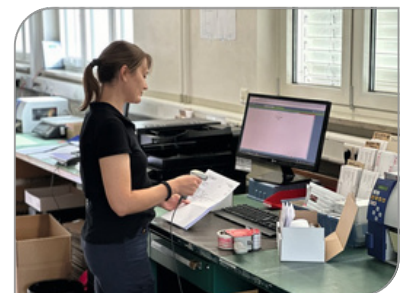
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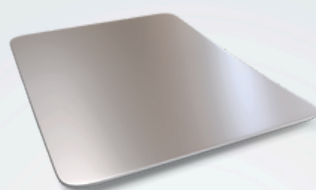




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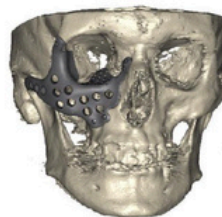
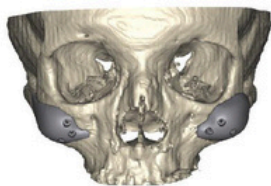
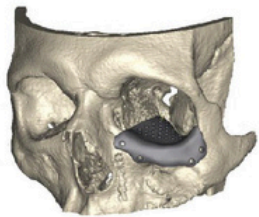
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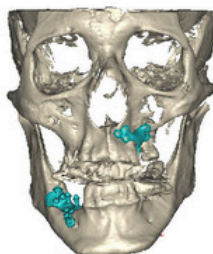
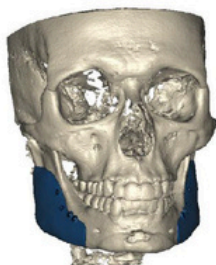
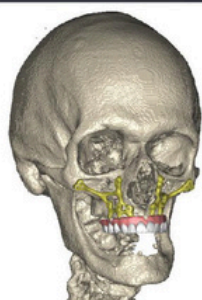


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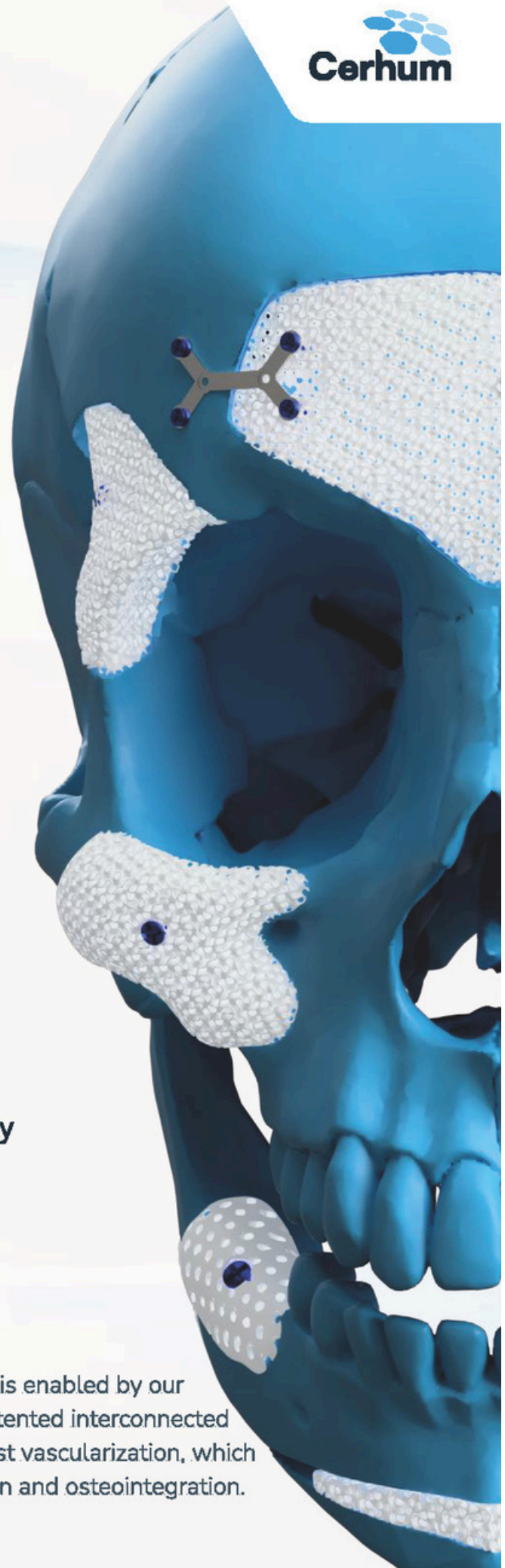
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ABSTRACTS

01.

Perioperative Anticoagulation in Free Flap Surgery in Maxillofacial Surgery

Authors:

Nikolaas Aelterman, P. Lejuste, B. dive, S. Shimwa-Karengera, T. Bourgeois, T. Dontaine

Department of Oral and Maxillofacial, Reconstructive Surgery, Grand Hôpital de Charleroi

Keywords: Anticoagulation, ACT, reconstructive surgery, anticoagulation protocol.

Introduction: Free flap surgery is a leading reconstructive surgery in maxillofacial surgery where venous microvascular thrombosis is an important risk for failure of the flap. At present, perioperative coagulation management is based on the use of traditional parameters, namely aPTT and INR. Nevertheless, these methods offer only partial functionality for the real-time vision of coagulation throughout extensive procedures. ACT (activated clotting time) is a common test used in other fields like cardiac surgery that facilitates dynamic adjustments in coagulation management. We would like to establish a standardized anticoagulation protocol based on the use of perioperative ACT values and anticoagulation monitoring methods at the Grand Hôpital de Charleroi to see if it is possible to implement this.

This proof-of-concept study assesses an anticoagulation protocol designed for the management of patients undergoing free flap surgery. Key aspects include accurate coagulation monitoring, optimal heparin dosage, and minimization of complications, particularly thrombosis and excessive bleeding.

Material and Methods: The study uses a standardized anticoagulation protocol with strict monitoring

Intraoperatively: A heparin bolus (50 IU/kg) was administered before flap ischemia. ACT monitoring was performed using a Memochron ACT-LR machine. ACT monitoring was performed 3 minutes after

the first bolus of heparin and continued every 30 minutes to achieve a target ACT value. After the surgery switch to LMWH and antiplatelet while monitoring the coagulation parameters.

Results: the discussion will refer to further results and conclusions as not all data are available yet.

Conclusion: this proof-of-concept study aims to assess the efficacy of a fixed-dose anticoagulation regimen. It also analyzes whether ACT monitoring may be a useful tool in maxillofacial surgery.

References:

1. Schröder, T. A., & Müller, B. (2022). Better anticoagulation in monitoring and treatment of reconstructive surgery Genomics 2022, 12, 1229.
2. Kim, S. R., & Kim, H. J. (2020). Maxillofacial defects reconstruction by microvascular. Journal of Oral and Maxillofacial Surgery
3. Wehner, J. E., et al. (2020). ACT for Monitoring of Low Dose Heparin Clinical and Applied Thrombosis/Hemostasis, 26, 1076029620975494.
4. Barton, B. M., et al. (2018). A systematic review of postoperative anticoagulation after free flap reconstruction for head and neck malignancy The Laryngoscope, 128(2), 412–421.

02.

The use of three iliac crest muscles for head and neck soft tissue reconstruction

Authors :

Eléonore Fourneau¹, H. Crèvecoeur¹, F. Nsimba-Bimwala¹

¹Centre Hospitalier Universitaire UCL Namur - Site de Sainte-Elisabeth

Keywords: muscular, free flap, iliac, reconstruction.

Objectives: We describe an innovative approach to reconstruct soft tissue in the head and neck region by diverting a flap originally intended for hard tissue reconstruction. To our knowledge, the oblique and transversus muscle free flap has never been described in the literature.

Material and Methods: We present four cases of patients with large tumor of the tongue, where the use of a radial free flap was challenging. Instead, we used the muscular portion of the iliac crest as a reliable alternative for reconstruction, offering a suitable oral lining. Using a muscular free flap, we achieved effective tongue reconstruction while minimizing donor site morbidity.

Results: We describe the use of a muscular free flap using the three iliac crest muscles (external, internal abdominal oblique, transversus abdominis muscles) and the deep circumflex iliac artery for the reconstruction of large defects in the oral cavity and facial region.

Conclusion: We describe a novel approach to reconstructing soft tissue in the head and neck region by diverting a flap originally intended for hard tissue reconstruction. The deep circumflex iliac artery muscular free flap demonstrates promising outcomes for large defects in the oral cavity and facial regions with low donor site morbidity. However, a comprehensive case series with functional assessments and long-term follow-up is necessary to evaluate potential complications, such as hernia formation.

03.

Oral rehabilitation in poly-allergic and multi-systemic disease. Patient with cleft lip and palate and fibular free flap, with quad zygomatic implants.

Authors: César Dauchot¹, C. Politis¹, C. Aubert², L. Evrard¹

¹ *HUB – ULB- Hôpital Erasme*

² *HUB-ULB- HUDERF*

Keywords: Implant Rehabilitation, poly-allergic, Fibular Free Flap, Cleft lip and palate, quad zygomatic implants.

Background: Oral rehabilitation in adult patients with complex anatomical and immunological profiles remains a major challenge. Different options exist, but implant rehabilitation may be rendered difficult if no maxillary bone is present, or if a considerable centripedal anatomical situation is present, or if the patient is poly-allergic.

Material and Methods: A patient with severe maxillary atrophy, maxilla centripedal resorption, classe III Angle, maxillary bone reconstruction with free flap, and multiple allergies necessitated oral rehabilitation.

Results: Different therapeutic options were considered, which are detailed in this presentation and quad zygomatic rehabilitation appeared to be the better option.

Conclusion: This case demonstrates that in highly challenging clinical situations, options are chosen considering both medical background and particularly allergic background, and technical possibilities regarding anatomical considerations.

04.

Rehabilitation of the atrophic edentulous maxilla with early loaded short implants: a new treatment concept.

Authors: Luc Van Doorne^{1,2}, C. Croo³, J. Carbonez², C. Vanderstraeten², R. Coopman¹
¹University Hospital, Department of Oral and Maxillo-Facial Surgery, Corneel Heymanslaan 10, 9000 Ghent
²Het Tandplein, private practice, Bilkske 68, 8000 Brugge
³Croodent, private practice, Driesstraat 60, 9090 Melle

Keywords: short implants, early loading, temporary overdenture, locator fixed bridge.

Objectives: alternatives for bone reconstructive implant rehabilitation in Cawood & Howell Class V-VI maxillary atrophy are scarce. The presented clinical case highlights a new minimal invasive procedure with follow-up up to 2 years.

Material and Methods: a 57-year female edentulous patient was dissatisfied with her removable complete denture in the upper jaw. After clinical and radiographic CBCT evaluation a Cawood & Howell Class V maxillary atrophy was diagnosed. Standard implant treatment without bone reconstructive surgery was impossible. She refused this treatment option even as the current available alternatives, such as Zygoma or AMSJI implants. A new treatment concept with short implants, retentive abutments and the registered VD CLIC BAR® was suggested. This new concept invented by the author, consists of an inter-implant connecting bar, clicking on retentive abutments and stabilizes the implants during integration. A telescopic overdenture covering the bar serves as a temporary prosthetic solution one week after surgery. This clinical case was included in an ongoing prospective clinical study at the Ghent University Hospital. The treatment protocol was approved by the Ethical commission and informed consent was signed by the patient. The surgery was performed under local anesthesia. After flap elevation 8 short implants with diameter 5.0mm and length 5.2mm were installed (Copa Sky Short, Bredent Medical, Senden, Germany) and provided with retentive abutments (TiSi snap abutment, Bredent Medical, Senden, Germany). After an intra oral digital scan the bar and the telescopic overdenture were designed and manufactured with a milling equipment (DC-7, Dental Concepts, Wesertal, Germany). Within one week after surgery the bar was clicked on the retentive abutments with the telescopic overdenture. After 6 months the final prosthetic solution was elaborated by the prosthetic dentist (CC) and consisted of a LOCATOR FIXED® bridge. On regular basis the patient was seen on recall visits with evaluation of the stability of the implants by Periotest and the assessment of Oral Health Related Quality of Life with OHIP-14 questionnaire.

Results: after 2 years all the short implants were still in place. A remarkable improvement of OHRQoL was achieved and improved stability was observed.

Conclusion: this newly developed concept can be advocated as an additional minimal invasive treatment alternative for rehabilitation of atrophic maxillary jaws.

05.

3D Finite Element Analysis of Biomechanical strains in Patients with Full Titanium Framework on Four Zygomatic Fixtures: systematic review and clinical application

Authors : Antoine Yanni, I. Larabi, L. Evrard
Oral and maxillofacial surgery department, HUB-ULB-Hôpital Erasme

Keywords: Finite Element, Zygomatic Fixtures, Biomechanical, Tridimensional.

Objectives: the position of zygomatic fixtures relative to the maxilla (intra-transsinusal or extra-maxillary) may affect biomechanical strains, potentially causing clinical complications. Finite Element (FE) analysis can predict biomechanical behavior of zygomatic fixtures, surrounding bone, and prosthesis. This study systematically reviews FE analyses of zygomatic fixtures and illustrate a case in order to establish new 3D FE analysis guidelines for predicting biomechanical behavior based on placement techniques.

Material and Methods: a PRISMA-based systematic review was conducted using five data sources (PubMed, Scopus, Elsevier Direct Science, Springer Link, Cochrane Library). Inclusion criteria: (1) FE studies, (2) edentulous/severely atrophic maxilla treated with implant-supported prosthesis, (3) no bone defects from tumors or congenital abnormalities, (4) zygomatic implants, (5) male and/or female participants, (6) publications in English or French. Ten studies were qualitatively analyzed for modeling approaches and FE calculation steps. Additionally, a 3D FE analysis was performed on a patient with a full titanium framework supported by four zygomatic fixtures. Von Mises stress and strain distributions were analyzed for different fixture placement approaches.

Results: of 329 titles identified, 68 full-text articles were reviewed, and 10 met inclusion criteria. The Brånemark technique, introduced in 2007, was the most modeled, appearing in six studies. The extra-maxillary approach, introduced in 2012, was featured in four studies, while the extrasinusal technique appeared in five. Maximum stress values across studies remained within acceptable limits (<900 MPa). In our 3D FE analysis, extrasinusal positioning provided the most favorable stress distribution and deformation for bone, fixtures, and prosthesis.

Conclusion: following the systematic review of the literature, studies on FE analysis of zygomatic implants primarily focus on theoretical models. We propose that 3D Finite Element analysis of real patients be implemented, as it allows for a more accurate comparison of the biomechanical behavior of bone, implants, and prosthesis.



Saturday – 10h30

06.

Keynote:

Practical Organistorical Challenges in Surgical Digitization: a centralised hospital-wide approach

Author: Renaat Coopman

University Hospital, Department of Oral and Maxillo-Facial Surgery, Corneel Heymanslaan 10, 9000 Ghent.

The 3D platform developed by UZ Gent offers an innovative solution for integrating advanced medical technologies, including Artificial Intelligence (AI), 3D printing, and Augmented Reality (AR), within a hospital-wide system. By utilizing a virtualized server infrastructure combining Central Processing Units (CPUs) and Graphics Processing Units (GPUs), the platform provides high-performance computing essential for real-time medical applications.

The integration of 3D printing allows for the creation of customized medical devices and implants, while AI and AR improve diagnostic accuracy, surgical planning, and patient care. Furthermore, the platform is designed to comply with General Data Protection Regulation (GDPR) and Medical Device Regulation (MDR), ensuring secure handling of sensitive patient data and adherence to regulatory standards. This scalable, hospital-wide infrastructure enhances operational efficiency, supports precision medicine, and enables groundbreaking innovations in clinical research and healthcare delivery. UZ Gent's 3D platform exemplifies the future of integrated, regulatory-compliant healthcare technology.

07.

Reconstruction of Craniomaxillofacial Bone Defects with 3D- Printed Bioceramic Implants

Authors: Maarten Verbist, J. Meeus, A. Van Mierlo, P-J. Verhelst, F. Van der Cruyssen, Y. Sun, E. Shaheen, R. Willaert
UZ Leuven

Objective: bony defects in the craniomaxillofacial region can result in significant esthetic and functional problems. 3D-printed patient specific ceramic implants mimic human bone and have certain advantages in comparison to titanium implants. The ceramic implant has excellent osteoinductive, osteoconductive and angiogenic characteristics to achieve osteointegration. This presentation aims to highlight the potential and benefits of this new type of ceramic implants in craniomaxillofacial reconstruction surgery. In addition, the technical aspects and clinical application will be illustrated by clinical cases. Also new innovations in this topic will be discussed.

Materials and methods: the PubMed and Embase databases were searched for patients with craniomaxillofacial bone defects treated with bioceramic PSIs. Clinical outcomes such as biocompatibility, biomechanical properties, and aesthetics were evaluated and compared to those of commonly used titanium or poly-ether- ether-ketone (PEEK) implants and autologous bone grafts. Two clinical cases are presented to illustrate the surgical procedure and clinical outcomes of HA bioceramic PSIs.

Results: literature review showed better a biocompatibility of HA PSIs than titanium and PEEK. The initial biomechanical properties were inferior to those of autologous bone grafts, PEEK, and titanium but improved when integrated.

Conclusion: HA bioceramic PSIs have excellent biocompatible properties and imitate natural bone biomechanically and radiologically. They are a well-suited alternative for conventional biomaterials in the reconstruction of load-sharing bone defects in the craniomaxillofacial region.

08.

3D bone graft design for preprosthetic reconstruction of the jaw: Presentation of 3D Work-Flow and Preliminary Results

Authors: Marvin D'Hondt¹, Y. Opdenakker², K. Borghgraef³, B. De Cuyper⁴

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Keywords: bone grafting; segmentation; 3D; preprosthetic surgery.

Objectives: autologous bone grafting is considered the gold standard for reconstructing the atrophic jaw. With advancements in technology, patient-specific 3D design has gained significant traction in the field of preprosthetic reconstruction. However, comparative studies examining the differences in success rates between conventional and 3D-planned preprosthetic procedures for local monoblock reconstructions are lacking. The primary objective of this study is to evaluate the potential benefits of 3D-planned local jaw augmentation using an autologous bone graft from the retromolar area for patients with a local defect in the alveolar ridge. The focus includes predictive reconstruction, time efficiency, and postoperative outcomes.

Material and Methods: a prospective study was conducted with the study population randomized into three groups: 1) 3D Planned (3P) group: Jaw augmentation was virtually planned; 2) 3D Planned and Guided (3PG) group: Jaw augmentation was virtually planned, and a 3D-printed cutting guide was utilized for harvesting the bone graft; 3) Control (C) group: Conventional jaw augmentation was performed without any 3D preparation. 3D segmentation and guide designs were created using 3D Slicer (<https://www.slicer.org>) and Meshmixer (Autodesk Inc.). The guides were fabricated through a commercial laboratory. Patients were followed for four months post-procedure. Statistical analysis was performed using IBM SPSS Statistics for Windows, version 21.0 (IBM Corporation, NY, USA). A significance threshold of $P < 0.05$ was applied to determine statistical relevance.

Results: this presentation focuses on outlining a 3D workflow and showcasing intermediate key findings supported by appropriate data visualizations from this ongoing study. Sample size calculations were informed by similar previous trials, determining that 10 patients per group are required to detect a 60% difference between groups with a significance level of 0.05 and a power of 80% (two-sided z-test with pooled variance for comparing proportions).

Conclusion: current experience with the 3D workflow for small monoblock autologous bone graft procedures demonstrates a feasible and practical protocol for planning local preprosthetic reconstructions. Preliminary findings indicate significant benefits in improving the predictiveness of these reconstructions. Specifically, visualization of the intended dimensions of the required bone graft provides advantages in reducing harvesting time and overall operating time. Additionally, 3D preparations minimize the need for intraoperative adjustments to the bone graft for optimal reconstruction. When compared to solely using 3D preparation, the inclusion of a cutting guide during surgery further enhances these benefits. However, final conclusions will only be possible after the completion of patient recruitment and comprehensive statistical analysis.

09.

The Biomimetic Periosteum: A Revolution in Reconstructive Strategies.

Authors: Charlotte Bodet¹, M. Kilic², L. Groeneveldt¹, S. Systermans¹, Y. Gilon¹
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Keywords: Biomaterials, Bone defect healing, Osteogenesis, Periosteum, Tissue-engineered periosteum.

Summary: Recent advances in bioengineering offer promising solutions to overcome the challenges of complex surgical reconstructions. Among these innovations, the development of biomimetic periosteum opens new perspectives due to its ability to mimic the biological functions of natural periosteum, particularly in bone regeneration. This presentation aims to explore the central role of biomimetic periosteum in modern reconstructive approaches. Following an introduction to the biological properties of the periosteum and its key role in tissue healing and regeneration, we will delve into innovative materials designed to replicate its structure and functions. Concrete clinical examples will illustrate its application in combination with 3D implants, hydroxyapatite bone substitutes, and vascularized flaps. Current challenges, such as the standardization of biomaterials and the limitations of bioprinting technologies, will also be addressed. Finally, a forward-looking discussion will focus on the integration of cell therapies and bioactive solutions into the treatments of the future.

10.

Bone Tissue Engineering for Large Maxillofacial Bone Defects: Enhancing Quality and Quantity with Growth Factors

Authors: Lisanne Groeneveldt^{1,2}, Y. Gilon²

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² *Department of Plastic and Maxillofacial Surgery, CHU, University of Liege, Belgium.*

Keywords: bone tissue engineering, scaffolds, BMP2.

Objectives: large bone defects in the maxillofacial region can be reconstructed using autologous bone, allografts, xenografts, or synthetic substitutes such as hydroxyapatite or metallic implants. However, these approaches are often associated with limitations, including donor site morbidity, limited availability of bone, immune reactions, and infection risks. Bone Tissue Engineering (BTE) offers a promising alternative by enabling the regeneration of larger bone segments from smaller tissue samples. BTE approaches may involve creating bone tissue entirely in vitro or establishing a scaffold-supported intermediate construct in vitro that subsequently integrates and matures within the defect site. While orthopedic research has made significant advancements in BTE, the application of this knowledge to the maxillofacial region is still evolving.

Material and Methods: periosteum-derived cells were combined with scaffolds for structural support and growth factors, including BMP2 and BMP6, to enhance bone regeneration. The scaffolds served as temporary frameworks to maintain structural integrity while facilitating tissue maturation and integration with surrounding bone. The experimental setup was designed to evaluate the effects of these growth factors on the quality and quantity of new bone formation.

Results: the addition of BMP2 and BMP6 significantly improved bone formation outcomes. Scaffolds successfully provided structural support during the early phases of tissue regeneration, enabling effective integration and maturation of the engineered bone tissue. Enhanced bone quality and volume were observed, indicating the potential of this approach for clinical applications in maxillofacial reconstruction.

Conclusion: BTE presents a promising alternative to traditional bone reconstruction methods that are often limited by donor site morbidity, limited bone availability, immune reactions, and infection risks. While significant progress has been made in orthopedic BTE, its application in the maxillofacial region remains underexplored. This study demonstrates the efficacy of growth factors such as BMP2 and BMP6 in enhancing bone regeneration, providing insights into improved reconstructive strategies. Collaboration with orthopedic research teams is essential to adapt and refine BTE approaches for maxillofacial applications, ensuring better patient outcomes.



Saturday – 11h50

11.

Keynote: Bio-inspired bone regeneration

Author: Debby Gawlitta, Associate Professor | Director Regenerative Medicine PhD program, GSLS Utrecht University |

Dept. of Oral and Maxillofacial Surgery & Special Dental Care, University Medical Center Utrecht, The Netherlands.

In the field of bone regeneration, a promising approach is to engineer cartilage tissues in the lab that can induce bone formation following in vivo implantation. These cartilaginous tissues are typically generated by using bone marrow-derived mesenchymal stem cells (MSCs). Such engineered cartilage mimics the soft callus tissue in the endochondral repair mechanism. Following implantation, the callus mimetics orchestrate the attraction of degrading osteoclasts, blood vessel invasion and new bone formation by osteoblasts. In our lab, we designed an allogeneic and off-the-shelf therapy for clinical translation and provided proof of concept in small and large preclinical models.

Besides cell-based regenerative strategies, osteoinductive biomaterials such as specific calcium phosphates can lead to in vivo bone formation. In our center, a clinical trial is ongoing to study the use of these materials in cleft palate closure.

Overall, this presentation will showcase the regenerative power of engineered hypertrophic cartilage tissues and smart biomaterials.



Saturday – 14h00

12.

Keynote:

Navigating digital workflows and novel technologies in oral healthcare.

Author: Bart VANDENBERGHE

DDS, PhD, international lecturer, Advimago Training Center, Brussels, Belgium.

The lecture will highlight the integration of digital workflows and advanced technologies in oral healthcare, focusing on how imaging, computer-aided planning, and 3D printing enhance diagnostic precision and treatment outcomes. It will explore the role of "teleradiology" and digital impressions in improving collaboration and patient comfort. The presentation will emphasize the transformative potential of these innovations in achieving better clinical results and patient care.

13.

Questioning the Utility of X-Guide in Implantology: Insights from Experienced Surgeons

Authors: César Dauchot, P. Lejuste, B. Dive, T. Dontaine
Grand Hôpital de Charleroi

Keywords: X-guide ; Insights ; Innovation ; Implantology ; Outcomes.

Summary: technological advancements such as X-Guide have been promoted as groundbreaking tools for improving precision and predictability in implantology. However, the practical benefits of such innovations remain debatable, particularly when evaluated by experienced surgeons with well-established workflows and successful long-term outcomes using free-hand techniques. This study aims to assess the practicability of X-Guide and tries to summarize positives and negatives concepts of this technology under a practical look. The findings highlight the importance of critically assessing the necessity and applicability of emerging technologies. For experienced surgeons, innovation should align with practical improvements in efficiency and outcomes, rather than replacing time-tested expertise.

14.

Computer-Assisted Navigation in Orthognathic Surgery.

Authors: Szonja Tancredi, A. Yanni, C. Politis, F. Shall, L. Evrard
Oral and maxillofacial surgery department, HUB- ULB- Hôpital Erasme

Summary: Maxillofacial surgery is undergoing a major transformation thanks to the integration of digital technologies. The use of 3D and intraoral scans for preoperative planning, combined with the use of 3D printers to create models and custom splints, represents a significant advancement in the pre-surgical process. These tools also provide greater autonomy to the department that uses them.

The aim of this presentation is to present a case of orthognathic surgery, which intergrates neuro-navigation.

This technology allows measurement of intraoperative surgical movements, enabling comparisons with those predicted during the initial digital planning. The goal of this pilot study case is to determine the accuracy of the performed displacements as well as the precision of the splints, identifying any differences with the prior planning. This direct comparison between planning and surgical reality opens new perspectives for significantly improving the precision of orthognathic procedures.

15.

Real-Time 3D Intraoperative Accuracy Verification in Orthognathic Surgery Using Intraoperative CBCT: Validation of IPS CaseDesigner and Comparison with Brainlab Elements - A Feasibility Study

Authors: Xander Jackers¹, G. De Fazio Renato^{1,5}, A. Diez-Fraile^{1,2}, J. Abeloos¹, T. De Backer^{1,4}, J. De Ceulaer^{1,4}, C. De Clercq¹, F. De Ketelaere³, M. Desmedt^{1,4}, P. Lamoral^{1,3}, K. Nagy¹, N. Neyt^{1,4}, K. Supply³, B. Veys^{1,3}, C. Spaas^{1,4}, G. Swennen¹

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Keywords: orthognathic, 3D Intra-operative imaging & accuracy, 3D superimposition software, 3D virtual planning.

Objectives: 3D virtual planning has revolutionized orthognathic surgery by enabling more precise diagnoses and predictive treatment planning, ultimately aiming for optimal function and aesthetics. However, the intraoperative (IO) transfer of 3D virtual plans remains prone to errors. Enhancing preoperative data acquisition, adopting standardized and clinically focused 3D virtual planning protocols, and refining surgical techniques can potentially improve the accuracy of planned movements. Despite these advances, current methods for verifying treatment outcome during surgery are limited, relying primarily on conventional clinical assessment which may be subject to bias. Recent technological advances, such as IO CBCT imaging and automated virtual superimposition software tools (e.g., IPS Casesigner, Brainlab), now enable real-time, high-quality, and more objective evaluations.

Materials and Methods: this study has been designed to qualitatively and quantitatively evaluate and validate the module of the IPS CaseDesigner software (KLS Martin). Thirty-six patient cases, all operated by the same surgeon (GS), were each analyzed twice by two independent observers (GLDF, XJ). The accuracy of three translational and three rotational movements was calculated. We also assessed inter- and intra- observer variability, as well as differences in clinical interpretation and duration of real-time IO evaluations. Finally, an illustrative comparison was made to the superimposition tool of the Brainlab Elements software.

Results: the results of this study demonstrated good inter- and intra-observer accuracy for the “Compare Models” tool in IPS Casesigner. A comparison with Brainlab Elements software revealed nuanced differences in functionality and performance.

Conclusion: while 3D virtual planning of orthognathic surgery has become the standard of care, 3D evaluation of treatment outcomes remains less commonly implemented. However, several new software tools are now available for real-time IO or immediate postoperative outcome evaluation. Integrating these tools into daily clinical practice can advance evidence-based medicine and improve quality control.

16.

Guided versus unguided All-on-4 implant placement: A retrospective study and future perspectives.

Authors: Simon Corthals¹, A. Diez-Fraile^{1,2}, J. Abeloos¹, T. De Backer^{1,4}, J. De Ceulaer^{1,4}, C. De Clercq¹, F. De Ketelaere³, M. Desmedt^{1,4}, P. Lamoral^{1,3}, K. Nagy¹, N. Neyt^{1,4}, B. Veys^{1,3}, C. Spaas^{1,4}, G. Swennen¹

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Keywords: Implantology, All-on-4, Dynamic navigation, X-Guide.

Objectives: the evolution of implantology has significantly transformed dental rehabilitation, offering reliable solutions for edentulous patients. Atrophic edentulous jaws, however, often present compromised bone quality and quantity, making implant placement challenging. Full-arch rehabilitation using the All-on-4 concept has emerged as a milestone in implantology, eliminating the need for extensive bone augmentation by tilting posterior implants. As implantology has advanced, guided systems, both static and dynamic, have been developed to enhance the accuracy of implant placement, particularly in complex cases. Dynamic navigation systems, such as X-Guide, enables real-time control and precision, potentially improving outcomes in challenging scenarios. This study compares outcomes of All-on-4 implants placed with and without dynamic navigation, highlighting its utility in complex cases and discussing future directions for improving accuracy.

Material and Methods: this retrospective study evaluated the outcomes of All-on-4 implants placed in the upper and lower jaws by a single surgeon (KS). Simpler cases, involving straightforward anatomy, were completed without dynamic navigation, while more complex cases, requiring precise control due to anatomical limitations, utilized X-Guide (Nobel Biocare). Primary outcomes were implant survival and success, while secondary outcomes included marginal bone loss and biological or mechanical complications. Cases placed since November 1, 2023, were analysed.

Results: implants placed without dynamic navigation demonstrated high survival and success rate, with minimal complications. In more complex cases, dynamic navigation facilitated precise placement and similarly favorable outcomes were observed. Marginal bone loss, and biological or mechanical complications were low across all cases, with detailed results to be presented.

Conclusion: the history of implantology reflects a continuous effort to improve outcomes in edentulous patients, with the All-on-4 concept addressing challenges posed by atrophic jaws. While unguided implant placement can achieve good results in simpler cases, dynamic navigation offers a critical advantage in complex scenarios, enhancing accuracy and predictability. This study confirms the effectiveness of dynamic navigation for All-on-4 implants and highlights opportunities for further advancements in guided implantology to refine surgical workflows, improve accuracy, and optimize outcomes in the future.



Saturday – 15h50

17.

Keynote:

Improving data capture in surgery.

Author: Andries CLINCKAERT
CEO of Tiro.health (<https://www.tiro.health/>) Gent, Belgium

During this keynote, we aim to seize the opportunity to assess the readiness of Belgian oral and maxillofacial surgeons for adopting AI-driven solutions in their field.

18.

Development and Evaluation of a GPT4-Based Orofacial Pain Clinical Decision Support System

Authors: Charlotte Vueghs¹, H. Shakeri¹, T. Renton², F. Van der Cruyssen^{1,3}

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Keywords: validation; development; large language model; GPT4; clinical decision support system.

Objectives: Orofacial pain (OFP) encompasses a complex array of conditions affecting the face, mouth, and jaws, often leading to significant diagnostic challenges and high rates of misdiagnosis. Artificial intelligence, particularly large language models like GPT4 (OpenAI, San Francisco, CA, USA), offers potential as a diagnostic aid in healthcare settings. To evaluate the diagnostic accuracy of GPT4 in OFP cases as a clinical decision support system (CDSS) and compare its performance against treating clinicians, expert evaluators, medical students, and general practitioners.

Material and Methods: A total of 100 anonymized patient case descriptions involving diverse OFP conditions were collected. GPT4 was prompted to generate primary and differential diagnoses for each case using the International Classification of Orofacial Pain (ICOP) criteria. Diagnoses were compared to gold-standard diagnoses established by treating clinicians, and a scoring system was used to assess accuracy at three hierarchical ICOP levels. A subset of 24 cases was also evaluated by two clinical experts, two final-year medical students, and two general practitioners for comparative analysis. Diagnostic performance and interrater reliability were calculated.

Results: GPT4 achieved the highest accuracy level (ICOP level 3) in 38% of cases, with an overall diagnostic performance score of 157 out of 300 points (52%). The model provided accurate differential diagnoses in 80% of cases (400 out of 500 points). In the subset of 24 cases, the model's performance was comparable to nonexpert human evaluators but was surpassed by clinical experts, who correctly diagnosed 54% of cases at level 3. GPT4 demonstrated high accuracy in specific categories, correctly diagnosing 81% of trigeminal neuralgia cases at level 3. Interrater reliability between GPT4 and human evaluators was low ($\kappa = 0.219$, $p < 0.001$), indicating variability in diagnostic agreement.

Conclusion: GPT4 shows promise as a CDSS for OFP by improving diagnostic accuracy and offering structured differential diagnoses. While not yet outperforming expert clinicians, GPT4 can augment diagnostic workflows, particularly in primary care or educational settings. Effective integration into clinical practice requires adherence to rigorous guidelines, thorough validation, and ongoing professional oversight to ensure patient safety and diagnostic reliability.

19.

Hedgehog pathway inhibitors, a new way of treating basal cell carcinoma?

Authors: Olivia Maleux¹, K. Berquin¹, A. Bral¹, D. Gorlé¹, S. Kalantary¹, V. Lenaerts¹, S. Ongena¹, R. Snel¹

¹ *VITAZ Hospital, Sint-Niklaas*

Keywords: locally advanced basal cell carcinoma, Hedgehog pathway inhibitors, neoadjuvant treatment, complex local flap reconstruction

Objectives: basal cell carcinoma (BCC) is the most common cancer in Caucasians. These tumours are characterised by a slow progression and rarely metastasize. Standard of treatment comprises of surgical excision with negative margins. However, for locally advanced tumours (laBCC), different treatment modalities may be considered according to specific patient characteristics. The recent use of Hedgehog pathway inhibitors (HPIs), such as Vismodegib and Sonidegib, plays an important role in the treatment of locally advanced, metastasized and recurrent BCC.

Material and Methods: ongoing research is being conducted to explore the potential benefit of immune modulating drugs versus surgery. Questions arise concerning the morbidity of complex facial reconstruction, possible adverse effects of immune modulating drugs (dysgeusia, muscle spasms, arthralgia...) and duration of its treatment. We conducted a literature review and a case report.

Results: this case presents an 80-year-old female with multifocal basal cell carcinomas. A large erosive lesion is located in the right paranasal area and two smaller ones in the left periorcular region. Treatment of choice was neoadjuvant Sonidegib. Large excision and complex reconstruction were avoided because of mediocre general health condition. After ten months of treatment, the erosive aspect had a good response to Sonidegib, but tumour foci were still present in the original margins of the extensive lesion. Sonidegib was discontinued because of troublesome muscle spasms and multidisciplinary oncological counsel decided upon surgical treatment.

Conclusion: laBCC treatment is complex and often requires a multidisciplinary approach. Neoadjuvant administration of HPIs can be helpful to reduce tumour size but cannot avoid reconstruction in patients eligible for surgery.

20.

Carotid body paraganglioma – presentation, management and pitfalls

Authors: Johanna Van Butsele, J. Jacobs, J. Orye, B. Baerts, E. Henquet, K. Grisar, B. Falter
MKA Jessa ziekenhuis, Hoofd-halscentrum Sint-Trudo ziekenhuis

Keywords: paraganglioma, carotid body, interdisciplinary management.

Objectives: paragangliomas are a group of neuroendocrine tumors arising from the paraganglia. They are rare, accounting for 0,6% of the tumors in the cervicofacial region. Although generally benign, 6- 19% of all head and neck paragangliomas develop metastases. Risk factors include chronic or intermittent hypoxemia and genetic predisposition. Due to their close proximity to vital structures, adequate recognition and treatment are of utmost importance to avoid unfavorable outcomes.

Material and Methods: in this presentation, key concepts are illustrated by aid of our own patient data.

Results: the clinical presentation of carotid body tumors consists of a cervical mass, dysphonia, tinnitus and headache. Symptoms related to cranial nerve compression and catecholamine release can sometimes be seen as well. The diagnosis is based on clinical examination and imaging (CT, MRI, arteriography). Obtaining a fine- needle aspiration biopsy is contraindicated due to possible bradycardia. Treatment options are conservative, surgical resection with or without preoperative embolization, radiotherapy or a combination of these options. An initial annual follow-up is recommended for the first 3 years. The interval can be lengthened afterwards to every other year for six years and every 3 years for the remainder.

Conclusion: carotid body paragangliomas require a specific approach. Interdisciplinary handling by a team of maxillofacial and vascular surgeons improves the outcome. Physicians should be aware of possible complications. Novel innovative techniques arise like treatment of locally unresectable somatostatin receptor (SSTR) imaging-positive paragangliomas with SSTR analogs. Genetic testing and counseling are recommended since germline succinate dehydrogenase mutations can indicate risk of multifocal and metastatic disease.

21.

The Effect of Pineapple Juice on Postoperative Outcomes Following Wisdom Teeth Extraction : A Prospective Randomized Controlled Trial

Authors: Kobbe Vervaeke^{1,2}, E. Shaheen^{2,3}, F. De Brauwier¹, M. Dom¹, J.T. Deferm¹

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Keywords: Wisdom Teeth, Pineapple Juice, Bromelain, Swelling, Pain.

Background: Social media platforms like TikTok have popularized the notion that pineapple juice, due to its bromelain content, can reduce swelling, pain, and bleeding associated with surgical procedures. Patients increasingly inquire about such trends, underscoring the need for scientific evaluation. Despite its widespread anecdotal acclaim, limited evidence exists to validate these claims in oral and maxillofacial surgery

Objective: To investigate the efficacy of pineapple juice consumption as an innovative, patient-driven approach for reducing postoperative pain, swelling, bleeding, and analgesic use following wisdom teeth extraction.

Methods: This prospective, randomized controlled trial includes patients undergoing bilateral third molar extractions under general anesthesia. Participants are randomized into two groups: the intervention group (pineapple juice) and the control group (no pineapple juice). Outcomes are evaluated through: Pain intensity using a Visual Analog Scale (VAS) on postoperative days 1, 3, and 7. Facial swelling at baseline and postoperative on day 3. Analgesic consumption recorded in milligrams of ibuprofen or paracetamol postoperatively.

Expected Results: It is anticipated that the intervention group will demonstrate improved postoperative outcomes compared to the control group, supporting pineapple juice as an effective adjunct in perioperative care.

Conclusion: By addressing a widely discussed social media trend, this study aims to bridge the gap between patient curiosity and scientific evidence, highlighting the role of patient-driven innovations in advancing oral and maxillofacial surgery.