



Semmelweis Egyetem Fogorvostudományi Kar Fogászati és Szájsebészeti Oktató Intézet

igazgató: Dr. Németh Orsolya Ph.D. egyetemi docens

<http://semmelweis-egyetem.hu/fszoi/>

<https://www.facebook.com/fszoi>

Navigált sebészeti beavatkozások a szájsebészetben

Készítette: Sréter Attila

Témavezető: Dr. Kivovics Márton, Ph.D.
egyetemi adjunktus



Oktatás, kutatás, gyógyítás: 250 éve az egészség szolgálatában



BEVEZETÉS



Digitalizáció fejlődése

- Backward planning



Navigált sebészet

- Statikus
- Dinamikus



Előny



Hátrány



Landaeta-Quinones C G, Hernandez N, and Zarroug N K: Computer-Assisted Surgery: Applications in Dentistry and Oral and Maxillofacial Surgery. Dent Clin North Am. 2018; 62 (3): 403-420.

Mezger U, Jendrewski C, and Bartels M: Navigation in surgery. Langenbecks Arch Surg. 2013; 398 (4): 501-14.

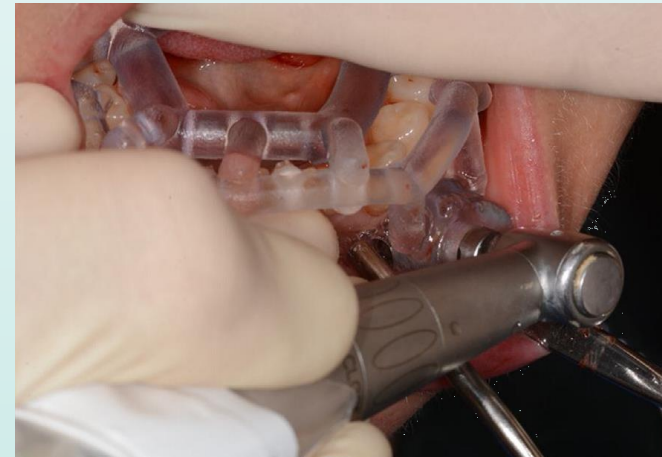
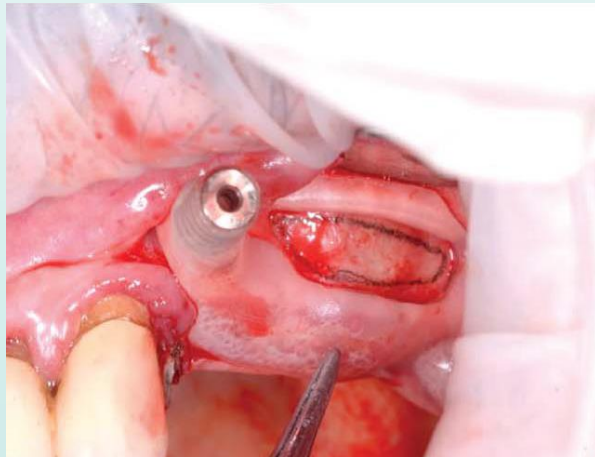
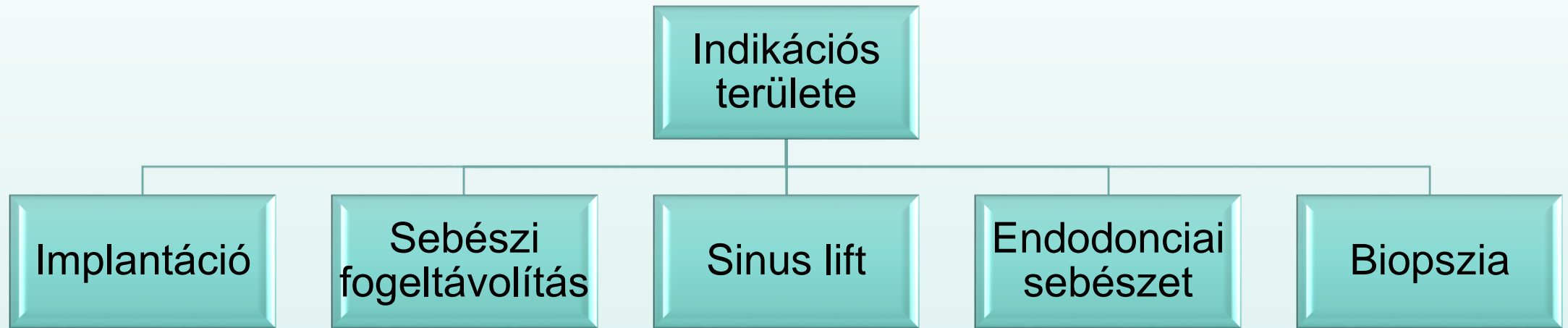
Deeb G R, Tran D Q, and Deeb J G: Computer-Aided Planning and Placement in Implant Surgery. Atlas Oral Maxillofac Surg Clin North Am. 2020; 28 (2): 53-58.

Ramezanzade S et al: Dynamic-Assisted Navigational System in Zygomatic Implant Surgery: A Qualitative and Quantitative Systematic Review of Current Clinical and Cadaver Studies. J Oral Maxillofac Surg. 2021; 79 (4): 799-812.

<https://www.nuova-asav.it/en/perche-la-digitalizzazione-in-odontoiatria-oggi-e-piu-importante-che-mai/>



NAVIGÁLT SEBÉSZET ALKALMAZÁSA A SZÁJSEBÉSZETBEN



Eve E J et al: Performance of dental students versus prosthodontics residents on a 3D immersive haptic simulator. J Dent Educ. 2014; 78 (4): 630-7.

Landaeta-Quinones C G, Hernandez N, and Zarroug N K: Computer-Assisted Surgery: Applications in Dentistry and Oral and Maxillofacial Surgery. Dent Clin North Am. 2018; 62 (3): 403-420.

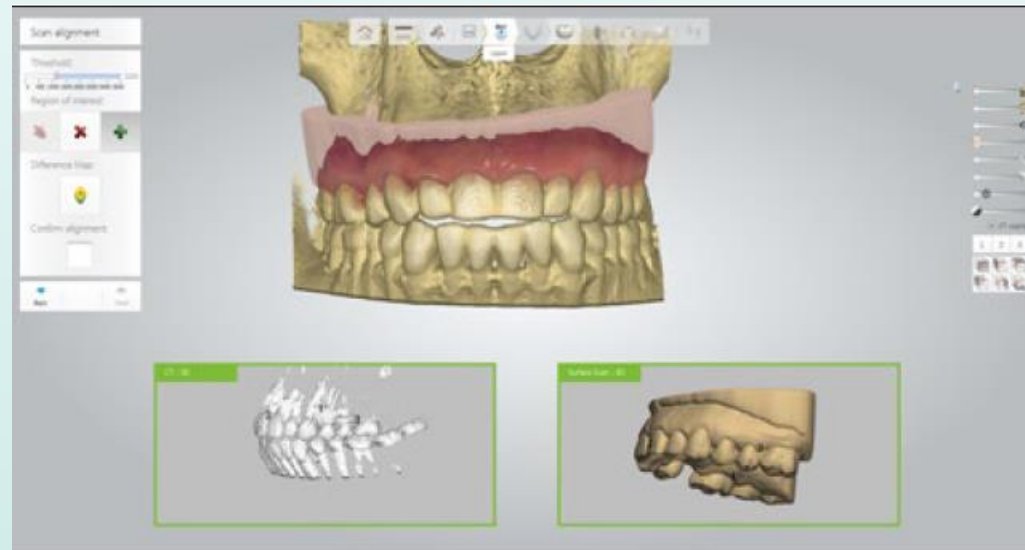
Joda T. et al: Augmented and virtual reality in dental medicine: A systematic review. Comput Biol Med. 2019; 108: 93-100.

Zaniol T et al: The Low Window Sinus Lift: A CAD-CAM-Guided Surgical Technique for Lateral Sinus Augmentation: A Retrospective Case Series. Implant Dent. 2018; 27 (4): 512-520

Valdec S et al: Guided biopsy of osseous pathologies in the jaw bone using a 3D-printed, tooth-supported drilling template. Int J Oral Maxillofac Surg. 2019; 48 (8): 1028-1031



STATIKUS NAVIGÁLT IMPLANTÁCIÓ MENETE



- Gargallo-Albiol J et al: Fully Guided Versus Half-Guided and Freehand Implant Placement: Systematic Review and Meta-analysis. *Int J Oral Maxillofac Implants.* 2020; 35 (6): 1159-1169.
- Gargallo-Albiol J et al: Advantages and disadvantages of implant navigation surgery. A systematic review. *Ann Anat.* 2019; 225: 1-10.
- Tahmaseb A et al: Computer technology applications in surgical implant dentistry: a systematic review. *Int J Oral Maxillofac Implants.* 2014; 29 Suppl: 25-42.
- Sun T M, Lee H E, and Lan T H: Comparing Accuracy of Implant Installation with a Navigation System (NS), a Laboratory Guide (LG), NS with LG, and Freehand Drilling. *Int J Environ Res Public Health.* 2020; 17 (6):
- Skjerven H et al: In Vivo Accuracy of Implant Placement Using a Full Digital Planning Modality and Stereolithographic Guides. *Int J Oral Maxillofac Implants.* 2019; 34 (1): 124-132



STATIKUS NAVIGÁLT IMPLANTÁCIÓ



Előny

- Kezelési idő
- Pontosság



Hátrány

- Tervezett műtéttől való eltérés
- Ár
- Tervezési és előkészítési idő
- Vízhűtés



Aydemir C A, and Arisan V: Accuracy of dental implant placement via dynamic navigation or the freehand method: A split-mouth randomized controlled clinical trial. Clin Oral Implants Res. 2020; 31 (3): 255-263.

Nikoyan L, and Patel R: Intraoral Scanner, Three-Dimensional Imaging, and Three-Dimensional Printing in the Dental Office. Dent Clin North Am. 2020; 64 (2): 365-378.

Wu Y et al: Real-Time Navigation in Zygomatic Implant Placement: Workflow. Oral Maxillofac Surg Clin North Am. 2019; 31 (3): 357-367.

Dr. Kivovics Márton képanyaga

Valdec S et al: Guided biopsy of osseous pathologies in the jaw bone using a 3D-printed, tooth-supported drilling template. Int J Oral Maxillofac Surg. 2019; 48 (8): 1028-1031.



SEBÉSZI SABLONOK CSOPORTOSÍTÁSA

Megtámasztás

- Implantátumon
- Nyálkahártyán
- Fogon
- Csonton



Sablonon keresztüli láthatóság

- Nyitott
- Zárt

Navigáció típusa

- Pilot-drill guided
- Half guided
- Full guided



Gargallo-Albiol J et al: Advantages and disadvantages of implant navigation surgery. A systematic review. *Ann Anat.* 2019; 225: 1-10.

Kernen F et al: A review of virtual planning software for guided implant surgery - data import and visualization, drill guide design and manufacturing. *BMC Oral Health.* 2020; 20 (1): 251.

Skjerven H et al: In Vivo Accuracy of Implant Placement Using a Full Digital Planning Modality and Stereolithographic Guides. *Int J Oral Maxillofac Implants.* 2019; 34 (1): 124-132.



DINAMIKUS NAVIGÁLT IMPLANTÁCIÓ MENETE



<https://news.cision.com/planmeca-oy/i/planmeca-and-navigate-surgical-technologies-join-forces-to-launch-innovative-solutions-for-dental-implant-surgery,c15543002>

An X et al: Immediate nonfunctional loading of implants placed simultaneously using computer-guided flapless maxillary crestal sinus augmentation with bone morphogenetic protein-2/collagen matrix. Clin Implant Dent Relat Res. 2019; 21 (5): 1054-1061.

Landaeta-Quinones C G, Hernandez N, and Zarroug N K: Computer-Assisted Surgery: Applications in Dentistry and Oral and Maxillofacial Surgery. Dent Clin North Am. 2018; 62 (3): 403-420.

Pellegrino G. et al: Dynamic Navigation in Dental Implantology: The Influence of Surgical Experience on Implant Placement Accuracy and Operating Time. An in Vitro Study. Int J Environ Res Public Health. 2020; 17 (6)



DINAMIKUS NAVIGÁLT IMPLANTÁCIÓ



Előny

- Pontosság
- Kezelési idő



Hátrány

- Nehéz használhatóság
- Ár
- Kijelző figyelése
- Tanulási görbe



D'Haese J et al: Current state of the art of computer-guided implant surgery. *Periodontol* 2000. 2017; 73 (1): 121-133.

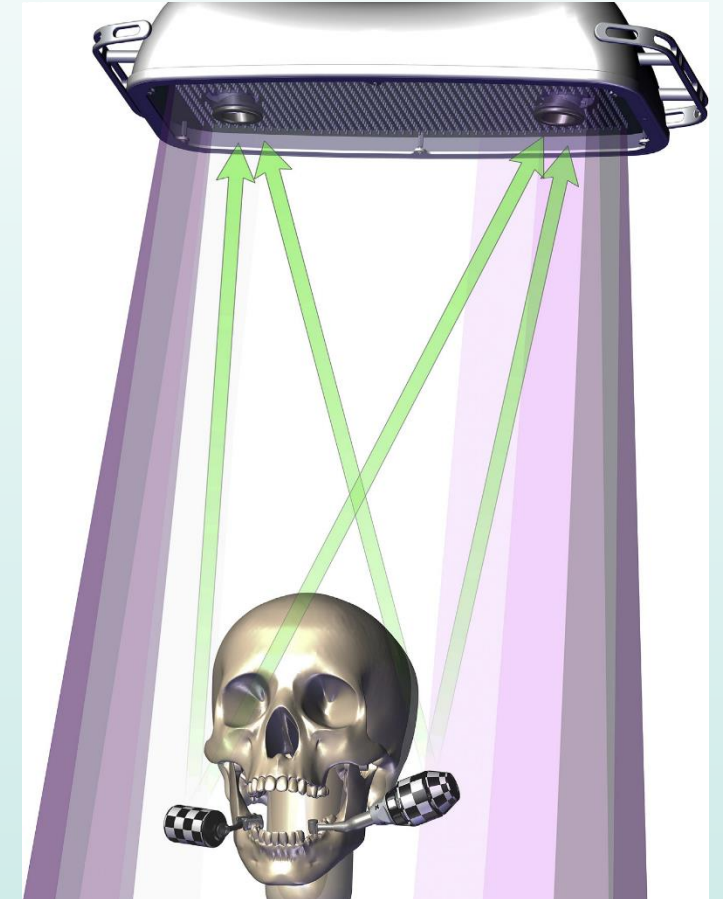
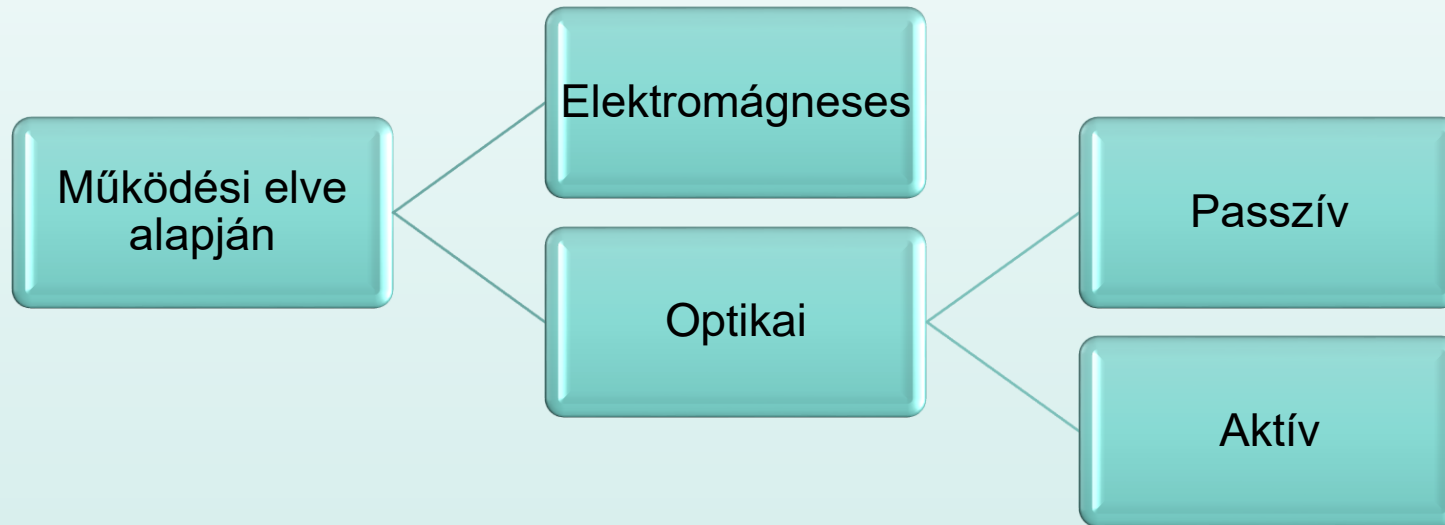
Landaeta-Quinones C G, Hernandez N, and Zarroug N K: Computer-Assisted Surgery: Applications in Dentistry and Oral and Maxillofacial Surgery. *Dent Clin North Am.* 2018; 62 (3): 403-420.

Pellegrino G et al: Augmented reality for dental implantology: a pilot clinical report of two cases. *BMC Oral Health.* 2019; 19 (1): 158.

<https://www.nobelbiocare.com/en-int/x-guide>



DINAMIKUS NAVIGÁCIÓ FELOSZTÁSA



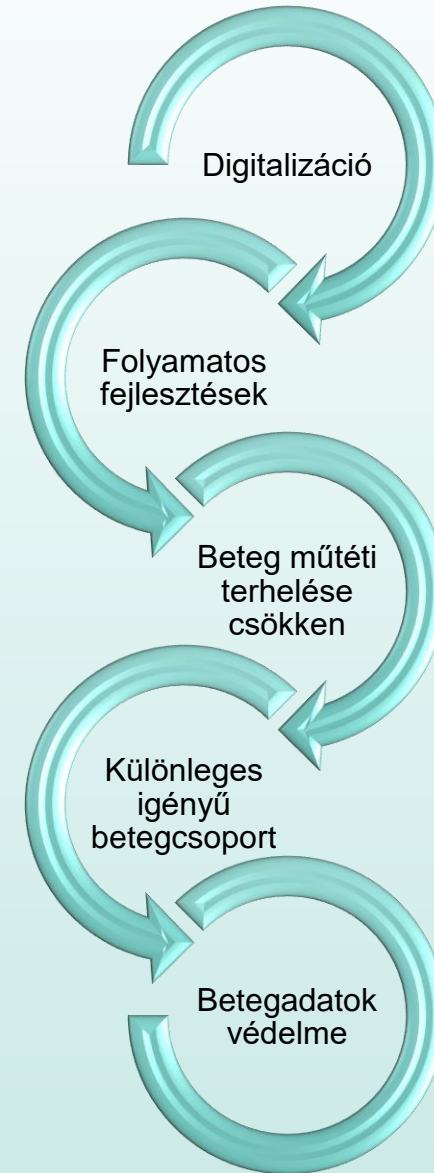
Block M S, and Emery R W: Static or Dynamic Navigation for Implant Placement-Choosing the Method of Guidance. J Oral Maxillofac Surg. 2016; 74 (2): 269-77.

Wu Y et al: Real-Time Navigation in Zygomatic Implant Placement: Workflow. Oral Maxillofac Surg Clin North Am. 2019; 31 (3): 357-367.

Pellegrino G et al: Dynamic Navigation for Zygomatic Implants: A Case Report about a Protocol with Intraoral Anchored Reference Tool and an Up-To-Date Review of the Available Protocols. Methods Protoc. 2020; 3 (4)



ÖSSZEFOGLALÁS





**Köszönöm a
megtisztelő figyelmet!**