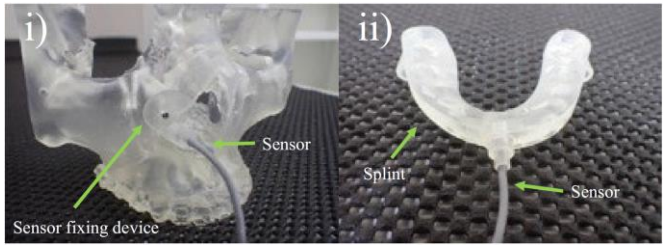
Tohoku Univ. Technology

Navigation System for Orthognathic Surgery

A system that serves as the surgeon's 'eyes' to dramatically improve surgical accuracy and safety



Tracking system sensors

Overview

Jaw and maxillofacial surgeries require precise alignment of the skull and jawbones, which demands highly accurate support tools. Existing surgical navigation systems (NS) are optical, and while they can display, for example, the name of the area being imaged by an endoscopic camera, they are not suitable for alignment during surgery. On the other hand, there is existing technology for magnetic NS for brain imaging, and it is applied on the premise of obtaining highly accurate CT images. However, in the dental field, issues arise, such as unclear CT images when metal prostheses are present, and difficulty in obtaining CT images during surgery.

This invention provides a magnetic surgical NS that can overcome these limitations.

【 Key Features 】

・**Linked to preoperative planning**: Target fixture position and orientation can be set on a 3D bone model generated from CT or digital scan data

・**Outstanding usability**: Real-time tracking, 3D coordinate axes for both target and actual positions, guidance for aligning multiple bone segments

・**High accuracy**: Overlap-based visualization allows intuitive alignment with submillimeter precision (within 1 mm) (Ref. 1)

・**Clear surgical view**: Magnetic system avoids light obstruction, with a compact design that doesn't interfere with the procedure

IP Data

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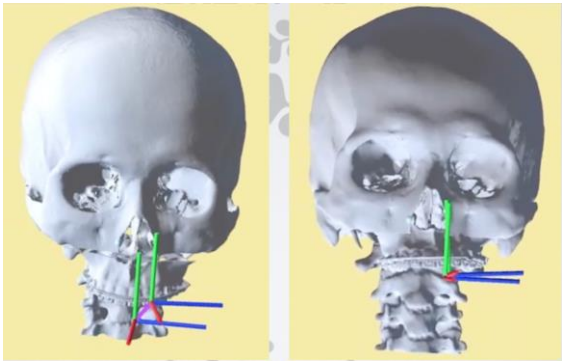
Features・Outstandings



・On the monitor screen, it is immediately clear whether the current position is aligned with the target position.
・Achieves alignment accuracy within 1 mm (Ref. 1).

Potential Applications

- ☐ Orthognathic surgery and jawbone reconstruction after cancer treatment
- ☐ Orthopedic procedures requiring precise multi-segment bone fixation

Related Works

[1] Br. j. oral maxillofac. surg., *in press*.

Contact

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