BV Pulsera with 3D-RX in maxillofacial surgery

Who/where

Craniofacial Centre Hirslanden, Aarau, Switzerland of the Hirslanden Group, with 13 hospitals and a total of 1200 beds.

Professor Dr. Dr. med. B. Hammer

Challenge

Intraoperative imaging in maxillofacial surgery

Solution

The BV Pulsera with 3D-RX

Founded in 2003, the Craniofacial Centre Hirslanden is one of the centers of excellence of the Hirslanden Group, which is the largest provider of private hospital care in Switzerland, with 13 hospitals and a total of 1200 beds. The medical team includes specialists from different fields (cranio-maxillofacial surgery, neurosurgery, ENT, interventional neuroradiology , and facial prosthetics) working together to provide optimal care for patients with diseases, injuries and malformations of the jaw, face, skull, and brain.

Professor Dr. Dr. med. B. Hammer is a doubly qualified cranio-maxillofacial surgeon.
His focus of interest is facial traumatology, orbito-cranial surgery and orthognathic surgery.
He has been working with the BV Pulsera with 3D-RX functionality for almost one and a half years.

Although intraoperative imaging is standard in every field of orthopedic surgery, it has not been routinely used in cranio-maxillofacial surgery, because conventional 2D images do not provide sufficient information on the complex anatomy of the facial skeleton. Intraoperative CT scanning was too complicated to become part of the clinical routine.

However, intraoperative imaging with the BV Pulsera with 3D-RX functionality has proved to be of great value for various applications in cranio-maxillofacial surgery, including orbital reconstruction and orthognathic surgery.

Professor Dr. Dr. med. B. Hammer, surgeon

PHILIPS

Orbital reconstructions

In complex orbital reconstructions, the position of bone grafts or titanium mesh was assessed and corrected if necessary (Figures 1,2) . The possibility of placing the image slices in every desired orientation allowed for precise comparison of the shape of both orbits.

"The BV Pulsera has become an essential device in my surgical practice"

Figure 1 : In this patient, bilateral enophthalmos was corrected using calvarial bone grafts to reconstruct orbital wall defects. Intraoperative imaging with the BV Pulsera shows accurate placement of the bone graft in the right orbit, but some adjustment of the graft position is necessary in the left orbit.

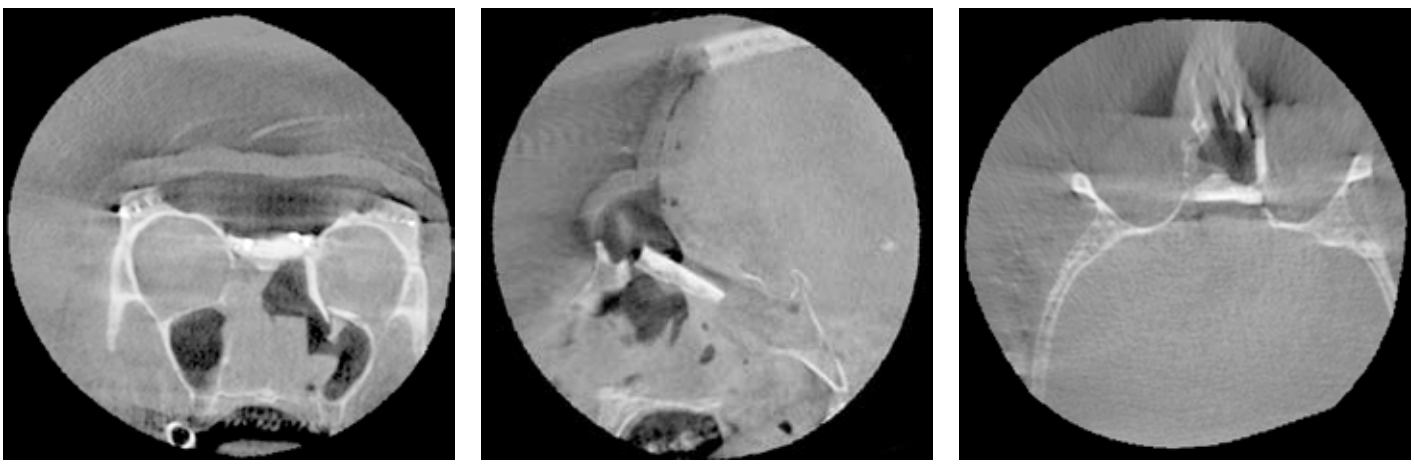

Figure 2: Intraoperative assessment of skull base and left orbital reconstruction after craniofacial tumor resection

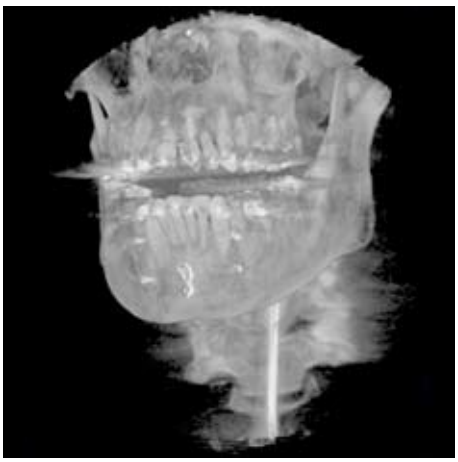

Figure 3: Pilot screws are inserted between the teeth in order to avoid damage to the roots during a segmental osteotomy. The BV Pulsera allows the position and angulation of the planned osteotomies to be checked.

Orthognathic surgery

Other applications included orthognathic surgery, where intraoperative imaging was helpful in avoiding damage to the roots of the teeth when performing segmental osteotomies (Figure 3), or for assessing accurate positioning of a large reconstruction plate inserted using the transoral approach (Figure 4) .

Image acquisition takes about five minutes, which does not interfere with the surgical routine. The BV Pulsera with 3D RX is easy to use, and is operated by the OR personnel. The high image quality allows for precise assessment of the shape and position of even thin bony structures , bone grafts and titanium plates or mesh.
Prof. Hammer: "The BV Pulsera has become an essential device in my surgical practice"

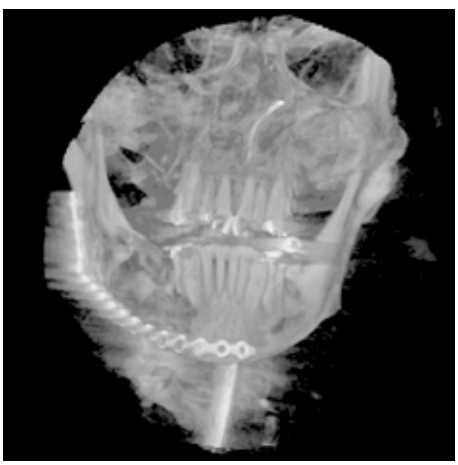

Figure 4 : Enucleation of a large keratocyst considerably weakened the mandibular body. A reconstruction plate is therefore inserted for reinforcement, inserted via the intraoral approach. The BV Pulsera is used to check accurate positioning of the plate at the lower mandibular border.

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