



IPS Implants®

Mandible Reconstruction





Oral and maxillo-facial surgery is our passion! Its further development, together with our customers, is our ambition. Every day we work on developing innovative products and services which meet the highest demands on quality, and which contribute to the wellbeing of the patient.

IPS® – Individual Patient Solutions

IPS Implants® Mandible Reconstruction

Defects of the jaw caused by trauma, tumor, infection or extreme atrophy affect patients' quality of life both physiologically and psychologically. Reconstruction surgery is usually inevitable to restore functional and aesthetical aspects.

Despite advances achieved in reconstruction techniques, it has always been a challenge to reconstruct the jaw to its original shape and configuration.

The use of modern technologies opens up new options in the treatment of complex defect situations. With the development of preoperative virtual planning as well as patient specific implants, another possibility to achieve a true-to-origin contour of resected bone has been established. IPS® offers matched solutions for the computer-based planning of surgical procedures, the efficient design of customized treatment concepts and the realization of these concepts in the operating theater with functionalized implants and planning aids.



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Feature, Function and Benefit



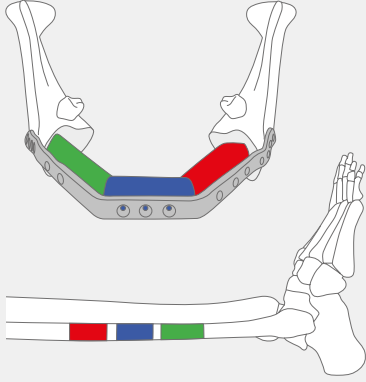
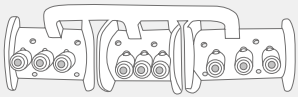
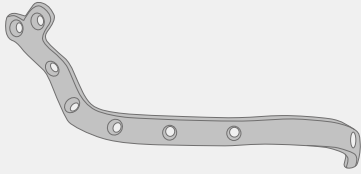
IPS® is ideal for solutions customized to the patient by a simple and efficient process – from planning to the functional implant.

We supply IPS Gate®, a platform that guides surgeons and users reliably and efficiently through the process of inquiring about, planning, and completing patient-specific products. The intuitive concept offers the user maximum mobility, flexibility, and functionality. With the HTTPS standard IPS Gate® ensures encrypted data transmission, which is additionally certified by the TÜV Süd seal.

Patient-specific implants, planning aids, and anatomical models are made from various materials using state-of-the-art fabrication technologies. Thanks to computer-based planning and functionalized patient-specific implants, preoperative planning can be implemented in surgery with unprecedented precision.

The resulting advantages for patients are reduced complication rates, improved esthetic and functional results, reduced surgical time and faster rehabilitation.

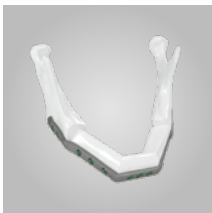
IPS Implants® – Mandible Reconstruction

| | Features and functions | Benefits |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Planning process</p>  | <ul style="list-style-type: none"> Simple and efficient interaction with the user via the IPS Gate® Planning, fabrication, shipping from a single source Range of options for planning <ul style="list-style-type: none"> Mirroring of the intact bones Targeted predetermination of the screw holes and the osteosynthesis screws to be used Planning time 6-9 working days | <ul style="list-style-type: none"> Maximum mobility, flexibility and functionality Complete service with the requirement for coordinating multiple services eliminated High degree of safety in planning Save time with efficient case processing |
| <p>Drill and marking guides</p>  | <ul style="list-style-type: none"> Enables transfer of virtual planning to the OR Exact projection of the donor region to the recipient region Integrated steel sleeves Integration of the vector view of dental implants to transplant planning Made of Polyamid or additive manufactured titanium alloy | <ul style="list-style-type: none"> Maximum safety with accurate determination of plate position and screw holes Minimized procedure in the donor and recipient regions No need for additional drill guides Positioning aid for customer-planned implant restoration resulting in an optimal prerequisite for later implant placement Variability in planning options and high biocompatibility |
| <p>Implant</p>  | <ul style="list-style-type: none"> Latest production technologies such as additive manufacturing Manufactured as standard from high-strength Ti6Al4V titanium alloy Implant based on the individual CT scan of the patient, already checked for perfect fit ex-works Plate can optionally be fixed with locking or non-locking screws As an alternative to the manufacture of a customized implant, a standard implant can be bent to fit the anatomy of the patient | <ul style="list-style-type: none"> Additive manufacturing technology provides complete freedom of design for implants Osteoconductive designs available High implant stability Best possible three-dimensional precision fit Rounded edges atraumatic for patients because trimming or bending are not required Maximum flexibility and stability Economical alternative |

Step by Step to Optimal Fixation

Indications

Reconstructions due to tumors, ulcers or cysts



Mandibular reconstruction
with transplant

- Fibula
- Scapula
- Iliac crest



Mandibular reconstruction
without transplant



Maxillary reconstruction
with transplant

- Fibula
- Scapula
- Iliac crest

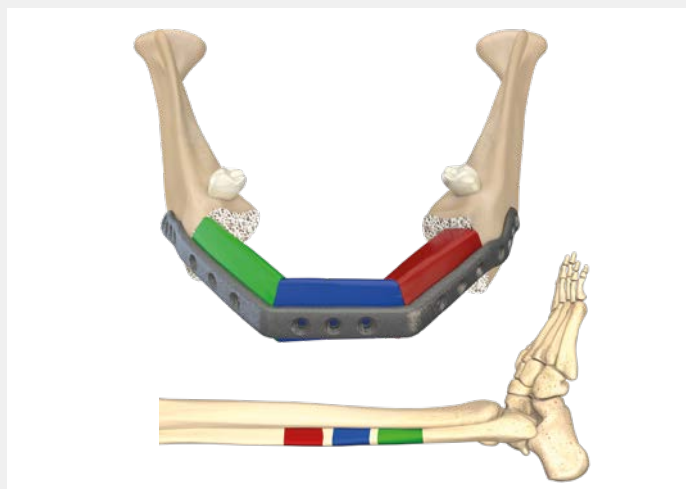
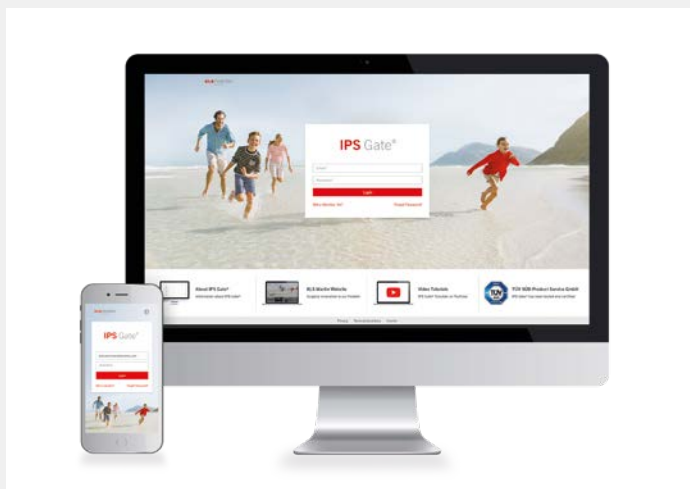


Surgical Technique

Mandibular reconstruction with fibula transplant

Pages 10 - 11





Virtual planning

To create the case the patient data and other case-related information are uploaded to the IPS Gate® web-based platform.

The IPS® developer prepares the case plan based on the information and the requests of the user. An integrated chat function and web meetings are available for direct communication between the IPS® developer and user.

Note:

More detailed information on how to prepare patient data for virtual planning can be found in our brochure "IPS Implants® Scan Protocol Cranium / Midface / Midface Orbita / Mandible / Mandible Reconstruction".



The resection lines are defined first. The donor region is virtually projected to the recipient region and the transplant is optimized for the best possible esthetic and functional restoration.

Then drill and marking guides and an implant optimized for the specific case are generated. The type, diameter and length of the osteosynthesis screws are defined.

At the end the user approves the design for production.

Warning:

If a mandibular reconstruction is performed without a transplant to bridge continuity defects, a plate with a plate profile of at least 3.0 mm must be used.

Mandibular reconstruction with vascularized and/or non-vascularized bone transplants can be restored with a thinner plate profile.

In principle, the probability of a plate fracture is statistically increased in the case of jaw reconstructions.



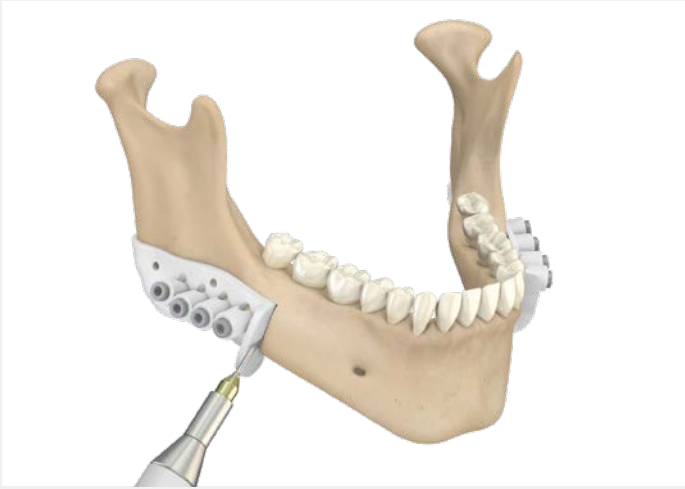
Preparation of the implant

Following approval, the patient-specific products are manufactured and shipped.

Then surgery can be initiated.

Note:

Patient-specific implants are not delivered sterile. Before use, they must be removed from their packaging and subjected to a suitable cleaning, disinfection and sterilization procedure.



Resection of the mandible

After preparation of the mandible, the drill and marking guides, which also predefine the cutting angle, are fixed to the mandible with 2.0 mm (or alternatively 1.5 mm) osteosynthesis screws. The small holes in the drill and marking guides serve to fix the guide to the mandible.

Then the resection lines are marked (in the illustration with a piezo device).

The screw holes for the implant are pilot-drilled through the large holes in the drill and marking guide. Steel guides are fitted into the holes, through which targeted drilling can be performed without additional drill guides.

The drill and marking guide is removed and the resection performed along the marked line.



Resection of the fibula

The fibula is prepared in parallel with the mandible. The resection is performed with the drill and marking guide, which is fixed to the fibula with 2.0 mm (or alternatively 1.5 mm) osteosynthesis screws, in the donor region in the same way as in the recipient region.



Fixing the implant

The IPS® plate is screwed to the mandible at the predrilled holes with the planned osteosynthesis screws. The transplant parts are inserted and the anastomosis is performed. Then the transplant parts are fixed with osteosynthesis screws.

As an alternative to the above procedure, the bone transplant parts can be fixed to the IPS® plate beforehand and then fixed to the mandible together with the plate.

Note:

In addition to the IPS® implant and the included drill and marking guides, the required osteosynthesis accessories (KLS Martin osteosynthesis screws in the planned diameters and lengths as well as the applicable twist drills and screw-drivers) must be available in sterile condition. They are not included in the IPS® package.

IPS Implants® | Mandible Reconstruction



Mandibular reconstruction with scapula transplant
*Restoration with additive-manufactured IPS® plate.
Fixed with locking screws.*



Mandibular reconstruction with fibula transplant
*Restoration with additive-manufactured IPS® plate.
Fixed with locking screws.*



Mandibular reconstruction without transplant planning
*Restoration with additive-manufactured IPS® plate
with mesh section. Fixed with locking screws.*



Mandibular reconstruction without transplant planning
*Restoration with additive-manufactured IPS® plate and
temporary condyle implant. Fixed with locking and standard
screws.*

*Note:
The temporary condylar head implant is not manufactured
specifically for the patient. The standard product must be
ordered separately and can be fixed to the IPS® plate.*



Mandibular reconstruction without transplant planning
Restoration with patient-specific bent standard plate.
Fixed with locking and standard screws.

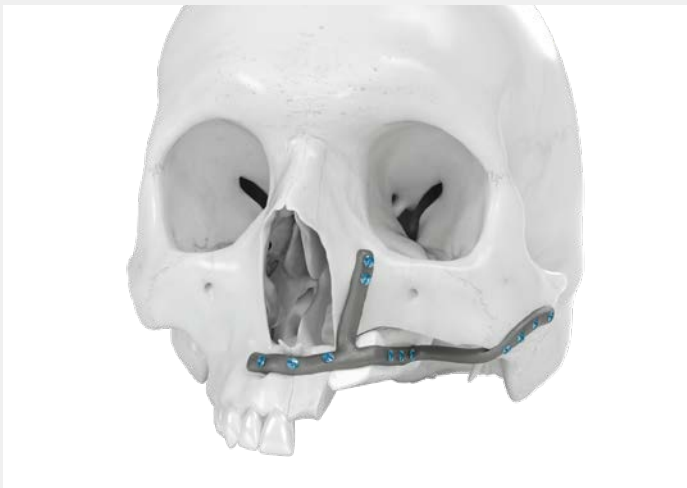


Mandibular reconstruction with a fibula transplant
Restoration with additively manufactured IPS® miniplates
(anterior symphysis) and Recon plates (posterior). Fixed with
angle-stable and standard screws. Forming the fibula into a
neocondyle using the marking guide.

IPS Implants® I Maxillary Reconstruction



Maxillary reconstruction with fibula transplant
Restoration with additive-manufactured IPS® plate.
Fixed with standard screws.



Maxillary reconstruction with fibula transplant
Restoration with additive-manufactured IPS® plate.
Fixed with standard screws.

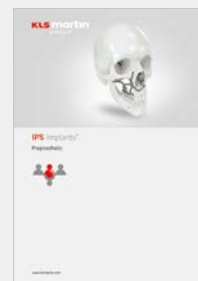
IPS Implants® I Preprosthetics



Mandibular reconstruction with fibula transplant
Restoration with additive-manufactured IPS® plate. Fixed with angle-stable screws. Subsequent restoration with an IPS Implants® Preprosthetic in one quadrant.



Mandibular reconstruction with fibula transplant
Restoration with additive-manufactured IPS® plate. Fixed with angle-stable screws. Subsequent restoration with an IPS Implants® Preprosthetic in two quadrants.



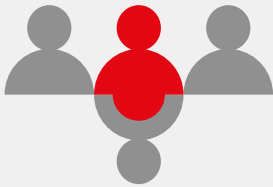
For further information,
please refer to the brochure
IPS Implants® Preprosthetic.

Osteosynthesis Accessories



In addition to the IPS® implant and the included drill and marking guides, the following osteosynthesis accessories in sterile condition are required for the surgical treatment:

- A sufficient number of KLS Martin osteosynthesis screws in the planned diameters and lengths
- A screwdriver to fit the planned osteosynthesis screws
- A twist drill to fit the planned osteosynthesis screws
- 2.0 mm osteosynthesis screws (alternatively 1.5 mm screws) for fixing the drill and marking guide with suitable twist drill and screwdriver
- If necessary, a temporary condyle implant with the specific screws



IPS CaseDesigner®

The IPS CaseDesigner® makes virtual 3D surgical planning easier and faster than ever before. With this flexible software tool, orthognathic procedures can be efficiently and reliably planned and simulated, and then applied to treatment in the operation in a customized manner.



IPS Gate®

The web-based platform and app guides surgeons and users reliably and efficiently through the process of inquiring about, planning, and completing patient-specific products. With the HTTPS standard IPS Gate® guarantees encrypted data transmission, which is additionally certified by the TÜV Süd seal.



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