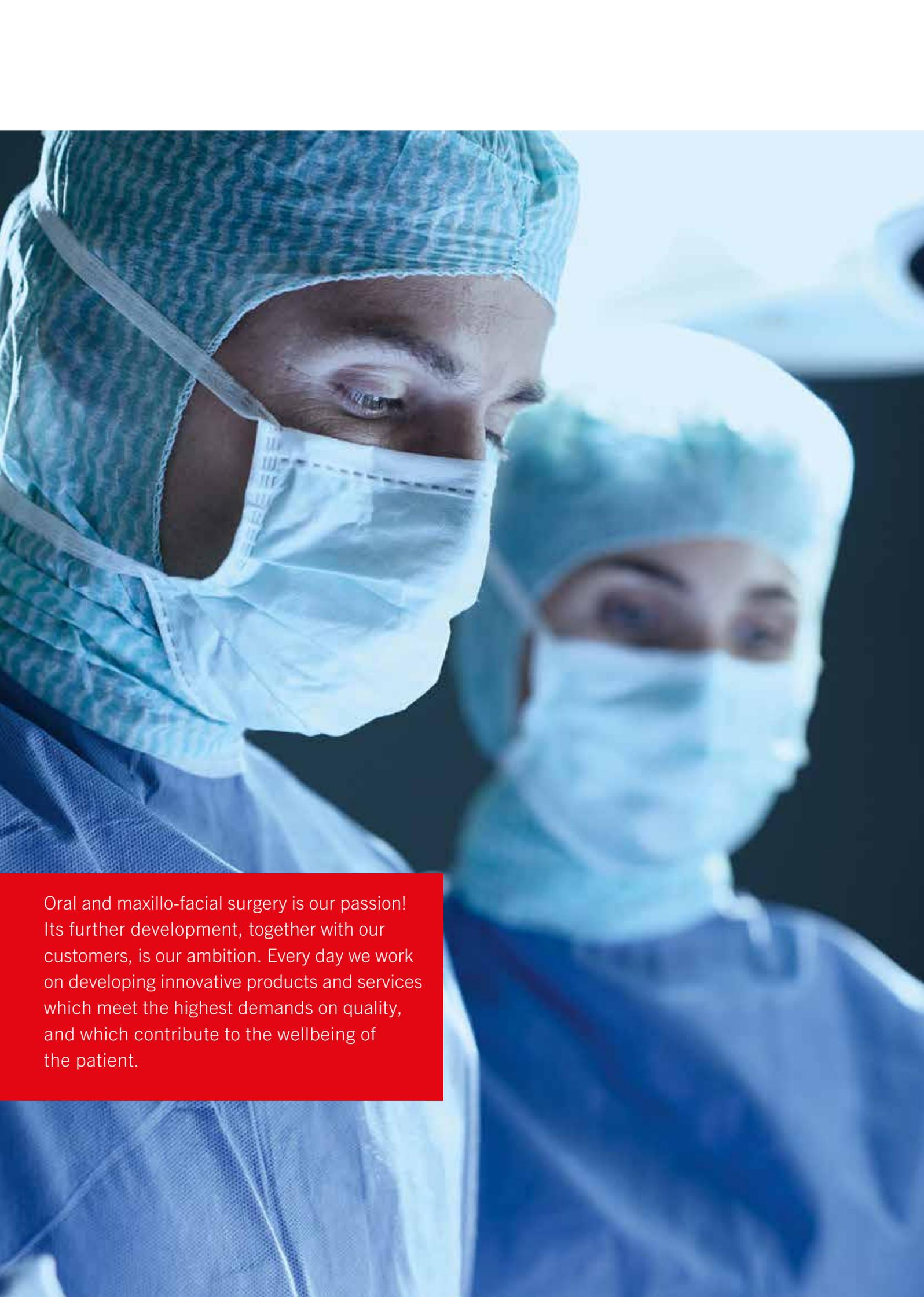




L1[®] MI Orthognathics

The Solution for Minimally Invasive
Orthognathic Surgery



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.

Table of Contents

	Pages
L1® MI Orthognathics – the Concept	4-5
Product Features	6-15
Indications and Surgical Techniques	16-45
■ MI Le Fort I Osteotomy	18-29
■ MI Sagittal Split Osteotomy	30-37
■ MI Chin Osteotomy	38-45
Product Range	
■ Instruments	46-63
■ Storage	64-65
■ Recommended Set Configuration	66-67
■ Standard Implants	68-69



L1® MI Orthognathics

The Concept

Orthognathic surgery is a key element of oral and maxillofacial surgery, so in the relevant clinics and practices it takes place almost every day.

Congenital or acquired dysgnathia is a phenomenon that is not uncommon – about one in ten are affected. Dysgnathia is usually accompanied by disharmony of facial appearance and functional impairment.

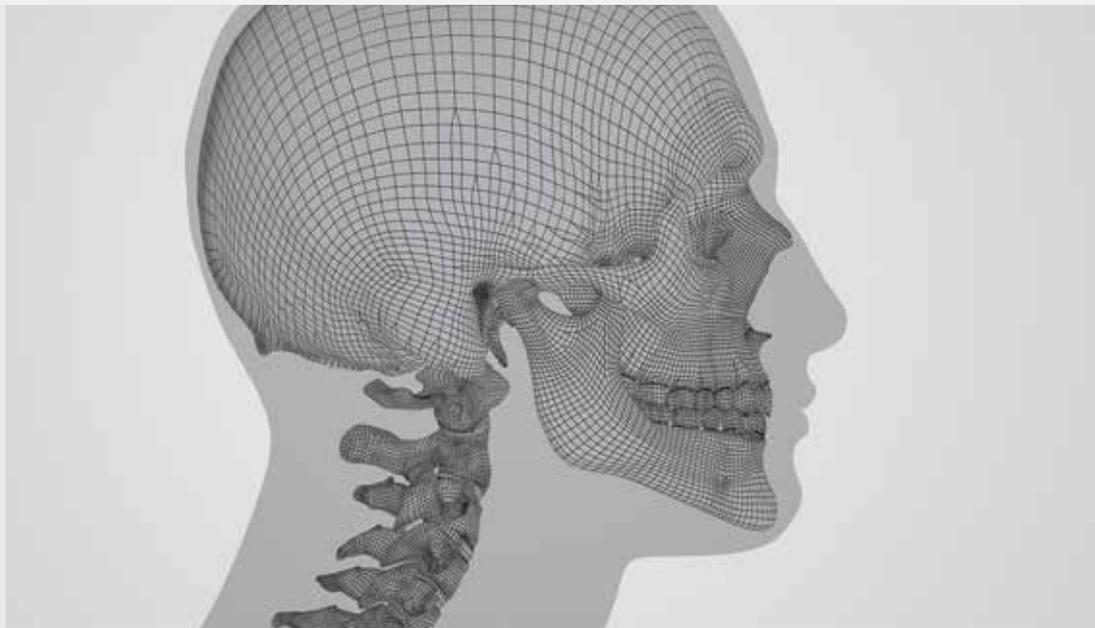
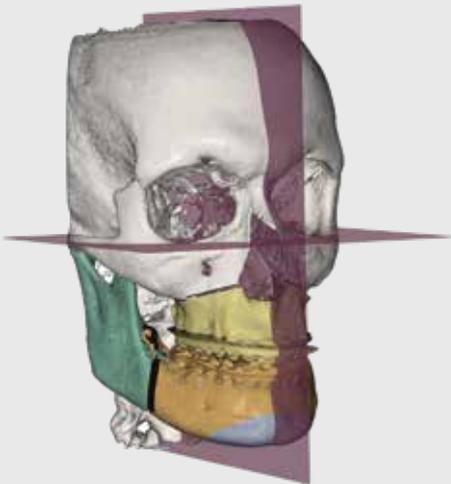
Elimination of skeletal discrepancies by corrective orthognathic surgery can achieve functional improvements of occlusion, respiration and airway.

The IPS CaseDesigner® makes 3D virtual surgical planning easier and faster than ever before. With this flexible software tool, planning and simulating surgical interventions become efficient and reliable.

L1® MI Orthognathics comprises of instruments and implants that were specially developed for minimally invasive orthognathic surgery. Consequently, the user has at his or her disposal a standardized solution for MI Le Fort I, MI Sagittal Split and MI Chin osteotomy. To ensure a safe and reproducible procedure the instruments are arranged using sequence templates and then they are used step by step.

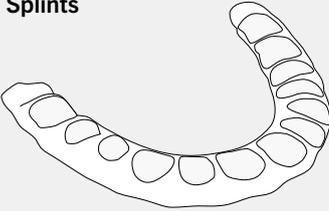
The entire procedure is based on Prof. Swennen's many years of experience. Maxillofacial and Facial Plastic Surgery, AZ St-Jan, Bruges, Belgium.

Feature – Function – Benefit



KLS Martin offers a wide range of implants for orthognathic surgery. Additionally, the IPS CaseDesigner® is a user-friendly software, which enables pre-surgical planning and simulation of surgery. Transfer of the planning results to the OR is normally performed using splints.

L1[®] MI Orthognathics – Planning Process

	Features and functions	Benefits
Digital planning IPS CaseDesigner[®] 	<ul style="list-style-type: none"> ▪ User-based orthognathic case planning with the KLS Martin planning software IPS CaseDesigner[®] ▪ Engineer-based orthognathic case planning with the KLS Martin planning software IPS CaseDesigner[®] 	<ul style="list-style-type: none"> ▪ Virtual planning created by user builds basis for potential designing and viewing of guides and implants ▪ Maximum flexibility and mobility ▪ Virtual planning created by a KLS Martin engineer based on customer requirements builds basis for potential designing of guides and implants ▪ Virtual planning as a service without any software installation
Conventional planning	<ul style="list-style-type: none"> ▪ Alternative planning based on lateral x-ray and cephalogram possible 	<ul style="list-style-type: none"> ▪ Combination of traditional planning and minimal invasive surgery
Splints 	<ul style="list-style-type: none"> ▪ Download splints as a result from previous digital planning ▪ Splint production by KLS Martin 	<ul style="list-style-type: none"> ▪ Transfer from planning to the OR
IPS Gate[®] 	<ul style="list-style-type: none"> ▪ Simple and efficient interaction with the KLS Martin engineer via the IPS Gate[®] ▪ Planning, production, shipping and local support from a single source ▪ Range of options for planning <ul style="list-style-type: none"> - Predetermination of screw positions - Screw diameter selectable, Ø 1.5 mm by default, alternatively Ø 2.0 mm - Realization of diverse implant geometries ▪ Planning time 8-9 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

Feature – Function – Benefit



L1® MI Orthognathics is primarily an instrument set that has been explicitly developed for minimally invasive treatment of deformities in the maxilla, mandible, and chin.

To restrict the instrument set to essentials, all the instruments are split up into logical groups and coded:

Code	Designation	Instruments
1. Mx	Maxilla	Mx1 – Mx5
2. Md	Mandible	Md1 – Md9
3. Ch	Chin	Ch1
4. MI	Minimally invasive	MI1 – MI4
5. RT	Retractors	RT1 – RT2
6. HK	Hooks	HK1 – HK3
7. OS	Osteotomes	OS1 – OS6
8. BI	Basic instruments	BI1-BI3, BI-TAP
9. SEQ	Sequence templates	SEQ1 – SEQ13

Using sequence templates the instruments required for MI Le Fort I, MI Sagittal Split, or MI Chin osteotomy are arranged according to the sequence of surgical procedure. As a result, the passing of instruments to the surgeon and their application are considerably facilitated for all those involved in the process. This is also how a reproducible sequence evolves.

L1[®] MI Orthognathics – Coding System

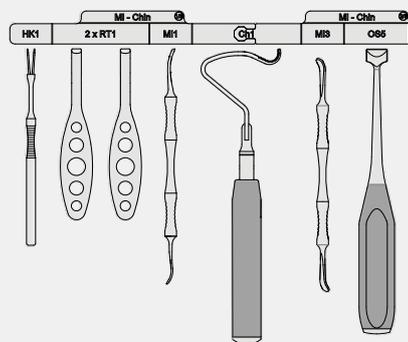
Features and functions

Benefits



- 34 instruments for minimally invasive orthognathic surgery, brought together in eight logically organized instrument groups

- Transparent organization and easy identification of instruments
- No redundant instruments – instruments can be used in all surgical techniques



- Unambiguous sequence for all three surgical techniques
- Arrangement of instruments according to sequence of surgical procedure

- Reliable and reproducible procedure
- Standardized passing of instruments to the surgeon
- Swift and intuitive supply of instruments during surgery
- User-friendly, efficient passing of instruments to the surgeon



- Labeled and numbered sequence templates

- Number, sequence and application are clearly visible

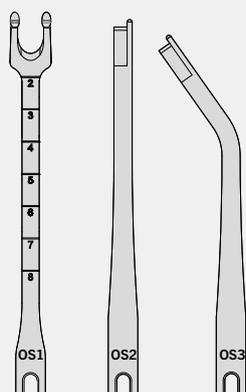


- Sequence templates with different locking mechanisms

- Sequence templates cannot be mixed up



OS1 OS2 OS3



- Each instrument has its own individual code

- Easy, unambiguous assignment within the surgical techniques
- Easy assignment when refilling
- Sequence of letters indicates which instrument group it belongs to
- Number indicates the sequence of use within an instrument group

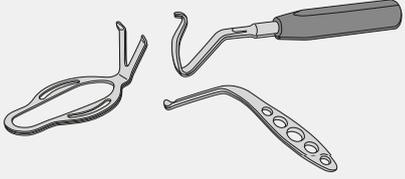
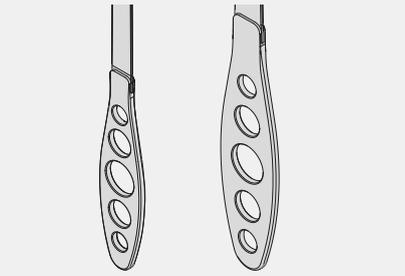
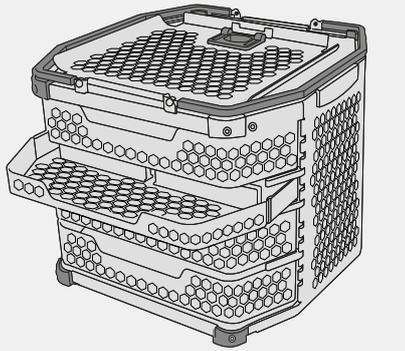
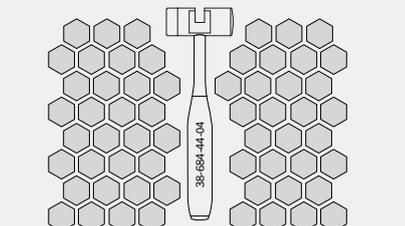
Feature – Function – Benefit



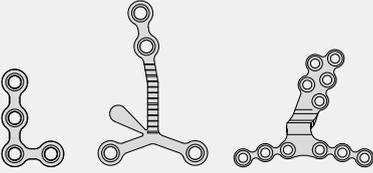
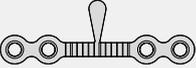
L1® MI Orthognathics instruments are specially designed to suit anatomical situations in the midface and mandible. On the one hand, special instruments were developed to be able to treat patients with reduced approaches in a soft tissue-sparing manner. On the other hand, a second objective was to use the instruments to create cavities that are large enough to allow safe treatment.

The storage container of the L1® MI Orthognathics system is based on the proven honeycomb design, which reduces weight, ensures high strength, and features large openings for optimized reprocessing. Each instrument has its own unique assigned place. The instruments are stored in drawers that are split up into defined groups. Consequently, access is bound to be swift with no risk of confusion. In addition, transparency is thus improved and the amount of space required in the sterile area is reduced. The design of the storage container also facilitates complete refilling of the set after the operation.

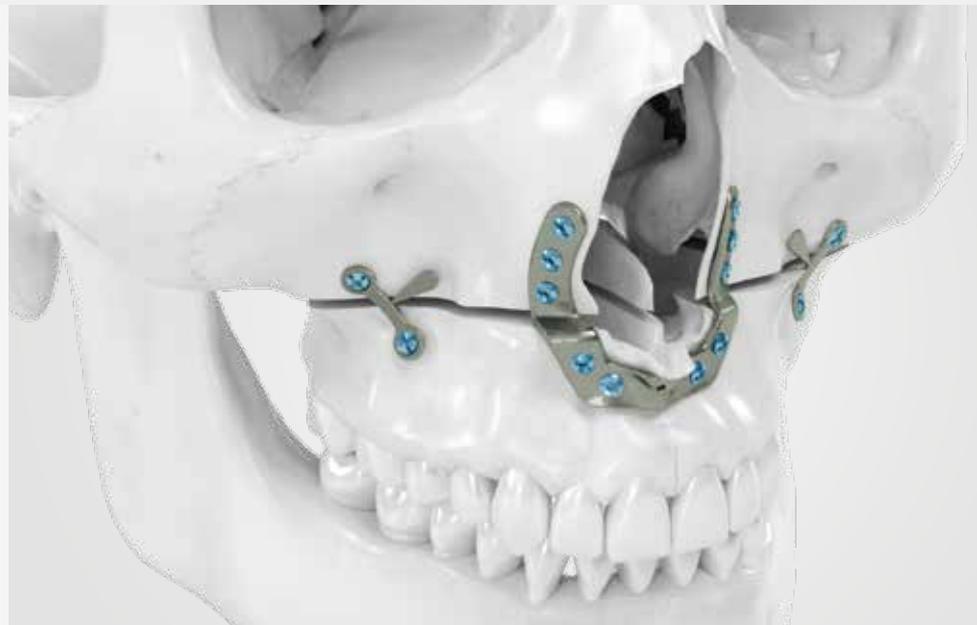
L1® MI Orthognathics – Instruments and Storage Containers

	Features and functions	Benefits
	<ul style="list-style-type: none"> ■ 34 instruments specially developed for <ul style="list-style-type: none"> - MI Le Fort I osteotomy - MI Sagittal Split osteotomy - MI Chin osteotomy ■ Specially designed to suit anatomical situations in the midface and mandible ■ Atraumatic design 	<ul style="list-style-type: none"> ■ Minimal incisions and reduced approaches ■ Rapid patient reconvalescence ■ Perfect passing of instruments to the surgeon within the created cavities ■ Soft tissue-sparing
	<ul style="list-style-type: none"> ■ Functional handle design with different handle sizes ■ Standardized handle design within the instrument groups 	<ul style="list-style-type: none"> ■ Facilitates use with appropriate amount of effort ■ Same haptics for similar instruments ■ Transparent and standardized appearance
	<ul style="list-style-type: none"> ■ Stainless steel storage containers of honeycomb design combined with high-performance plastic ■ Stackable mesh trays ■ Instruments stored in six coded drawer modules 	<ul style="list-style-type: none"> ■ High strength, light weight ■ Easy to rinse out due to large openings ■ Minimal space requirement in the OR ■ Reliable reprocessing ■ Transparent, space-saving storage ■ Swift, systematic access ■ Space-saving direct access from the front
	<ul style="list-style-type: none"> ■ Drawer bottom with laser images and article numbers 	<ul style="list-style-type: none"> ■ For easy refilling ■ For easy reordering

L1[®] MI Orthognathics – Standard Implants

	Features and functions	Benefits
<p>MI Le Fort I osteotomy</p>  	<ul style="list-style-type: none"> Large portfolio of 1.5 Micro plates and 2.0 Mini plates in various shapes Various profile thicknesses available Specially developed 2.0 Mini 2-hole plate with holding and placement tab With 5-mm and 7-mm bar 	<ul style="list-style-type: none"> Maximum selection for the user Customization to suit anatomical situations Small plate for easy placement at the lateral margin of the maxilla, especially if the approach is small Suitable for small and large correction values
<p>MI Sagittal Split osteotomy</p>   	<ul style="list-style-type: none"> BSSO sliding plates with slider Proven standard designs in the 2.0 Mini system Plates with graduation 2.0 mm dia. maxDrive[®] screws for screw osteosynthesis Various lengths available 	<ul style="list-style-type: none"> Enables rotation as well as vertical and horizontal alignment prior to final fixation Wide range of alternatives to the special plates Visual indicator for the displacement value Alternative to osteosynthesis without plates, especially if approach is reduced Selection according to anatomical situation
<p>MI Chin osteotomy</p> 	<ul style="list-style-type: none"> Wide range of preformed 1.5 Micro and 2.0 Mini plates with predefined displacement values 	<ul style="list-style-type: none"> Selection from three proven systems: <ul style="list-style-type: none"> - 2.0 Mini - Arnett - Lindorf

Feature – Function – Benefit



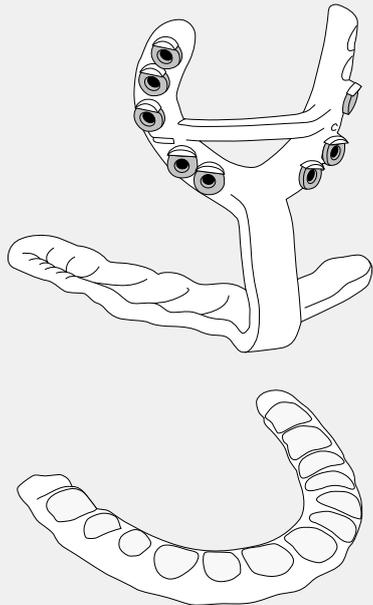
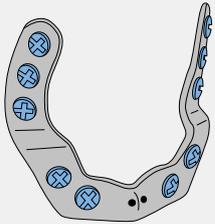
IPS® is ideal for solutions customized to the patient by a simple and efficient process – from planning to the functional implant.

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.

The combination of precise virtual planning with the IPS CaseDesigner®, dedicated minimally invasive instruments (MI Orthognathics®), a smart guide and implants design allows a less traumatic minimally invasive surgical transfer of the treatment plan.

The resulting advantages for patients are improved esthetic and functional outcome with decreased patient morbidity and faster postoperative rehabilitation due to overall reduced surgical operating time with minimal soft tissue degloving.

IPS® Implants – MI Orthognathics

	Features and functions	Benefits
<p data-bbox="105 481 375 548">Drill and marking guides, orthognathic splints</p> 	<ul style="list-style-type: none"> ■ Enables minimally invasive transfer of the virtual planning to the OR ■ Integrated steel sleeves ■ Made of polyamide or additive manufactured titanium alloy ■ Orthognathic splints made of acrylate/methacrylate resins ■ Integrated bilateral guide 	<ul style="list-style-type: none"> ■ Maximum safety with accurate determination of plate position and screw holes ■ No need for additional drill guides ■ Variability in planning options and high biocompatibility ■ Transparent and processible ■ Precise para-nasal marking and performing of the Le Fort I osteotomy
<p data-bbox="105 1276 207 1310">Implants</p> 	<ul style="list-style-type: none"> ■ Production using the latest additive manufacturing technology ■ 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 ■ Integrated customized correction of the anterior nasal spine (ANS) ■ Suture holes for nasal septum fixation 	<ul style="list-style-type: none"> ■ Additive manufacturing technology provides complete freedom of design for implants ■ High three-dimensional implant stability ■ Best possible three-dimensional precision-fit ■ Rounded, atraumatic edges avoid trimming and bending ■ Precise and fast placement ■ Allows esthetic soft tissue management

Step by Step to Optimal Treatment

Indications

L1® MI Orthognathics is especially used for minimally invasive osteotomy in orthognathic surgery.



MI Le Fort I Osteotomy



MI Sagittal Split Osteotomy



MI Chin Osteotomy



Surgical Techniques

MI Le Fort I Osteotomy

Prof. Dr. Dr. Gwen Swennen

Pages 18-29



MI Sagittal Split Osteotomy

Prof. Dr. Dr. Gwen Swennen

Pages 30-37

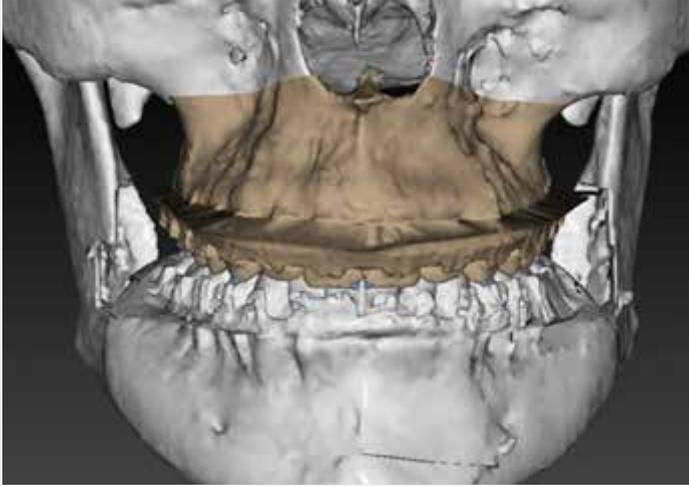


MI Chin Osteotomy

Prof. Dr. Dr. Gwen Swennen

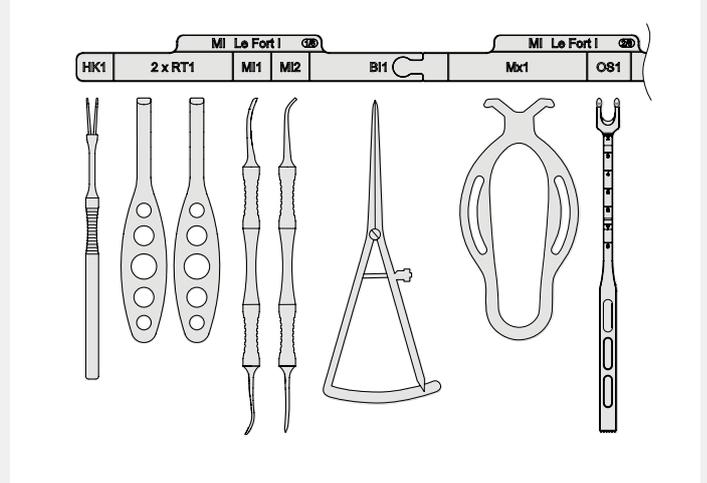
Pages 38-45





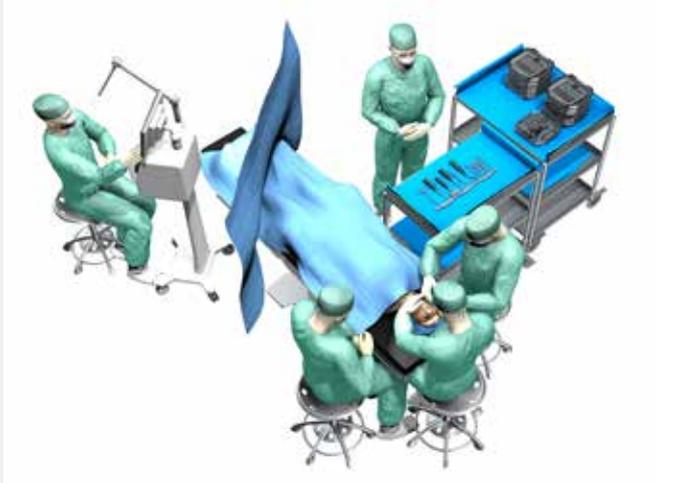
Pre-surgical 3D virtual planning

Using the IPS CaseDesigner® individualized 3D virtual planning of a Le Fort I osteotomy can be performed in a user-friendly way in daily clinical routine.



Instrument preparation

The surgical sequence bar is an innovative device to aid the operating nurse in following the MI Le Fort I procedure. It indicates which L1® MI Orthognathics instruments need to be extracted from the instruments storage container at any given time point of the surgery. The L1® MI Orthognathics surgical codes and sequences are an excellent organization tool and optimizes surgical efficiency in order to decrease patient morbidity.



Patient positioning

To perform a MI Le Fort I osteotomy, the patient is positioned in a supine position on the operating table. Nasal intubation is performed with the tube positioned in the midline closely adapted to the forehead midline contour of the patient.

The operating surgeon is positioned in front of the head of the patient while two surgical assistants are positioned laterally at both sides of the head of the patient.

In the ideal setting, the anaesthesiologist is positioned at the left side of the patient's feet while the surgical nurse is positioned at the right side of the patient's thorax.



Surgeon's view

The following MI Le Fort I osteotomy is shown from the surgeon's perspective.



1. Soft tissue approach to the Le Fort I

The MI approach towards a Le Fort I osteotomy starts by gently placing a soft tissue double hook (HK1) by the operating surgeon in the midline of the mucosa of the upper lip close to its border. Consecutively, two small curved soft tissue retractors (2x RT1) are placed by the two surgical assistants to retract the soft tissues of the upper lip.

A mucosal incision is made from lateral to lateral incisor using a 15 scalpel or a Colorado knife followed by incision of the deep layers through the periosteum at the Le Fort I level allowing a good muscle bulk for paranasal cross-suturing of the nasolabial muscles.

2. Subperiosteal dissection of the medial pillar of the maxilla

Strictly subperiosteal degloving is now performed using the large part of the double-sided sharp raspatorium (MI1) along the right lateral nasal wall. Consecutively, the inner part of the lateral nasal wall is degloved initially using the small part of the double-sided sharp raspatorium (MI1) and then with its larger part.

Same procedure at the left side.



HK1
skin hooklet



2x RT1
retractor



RT1
retractor



MI1
raspatory



3. Marking landmarks for vertical repositioning of the maxilla

Prior to the Le Fort I osteotomy, landmarks are marked by the operating surgeon using a calliper (BI1) and a thin fissure burr, while the soft tissues are protected by the surgical assistants using a double retractor (Mx1) and a blunt double-sided elevator (MI2).

Same procedure at the left side.



4. Degloving of the nasal floor and septal release

Strictly subperiosteal degloving is now performed of the nasal floor using the large part of the double-sided sharp raspatorium (MI1) by the operating surgeon followed by septal release under finger control at the posterior palatum using a septum osteotome (OS1) and a mallet (BI-TAP).





5. Exposure of the maxilla by subperiosteal tunneling

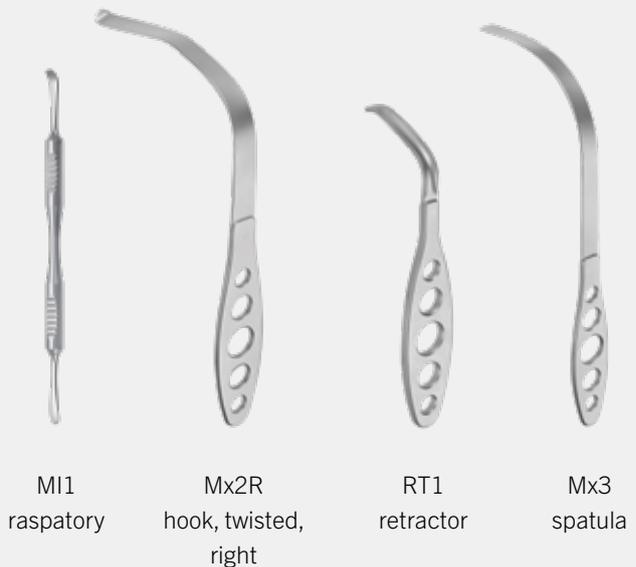
A subperiosteal tunnel is now made using a sharp raspatorium (MI1) in the direction of the infra-zygomatic crest where a curved soft tissue retractor (Mx2R) is placed by the operating surgeon. Consecutively, a thin malleable soft tissue retractor (Mx3) is placed at the inner side of the lateral nasal wall. An additional small soft tissue retractor (RT1) is positioned at the lateral nasal wall and held by a surgical assistant.

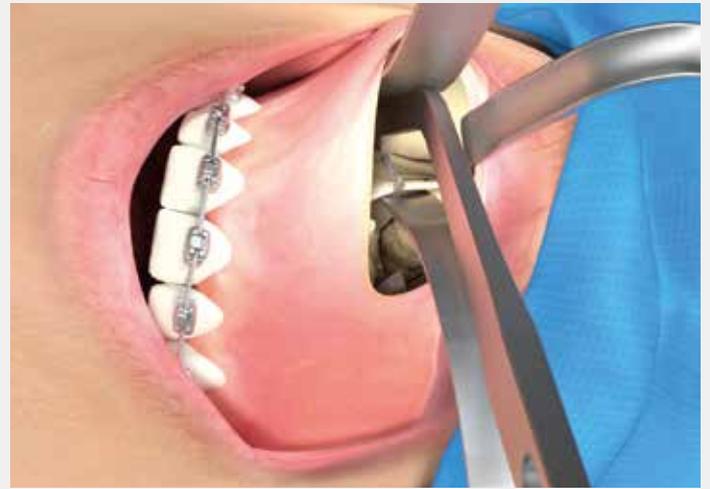
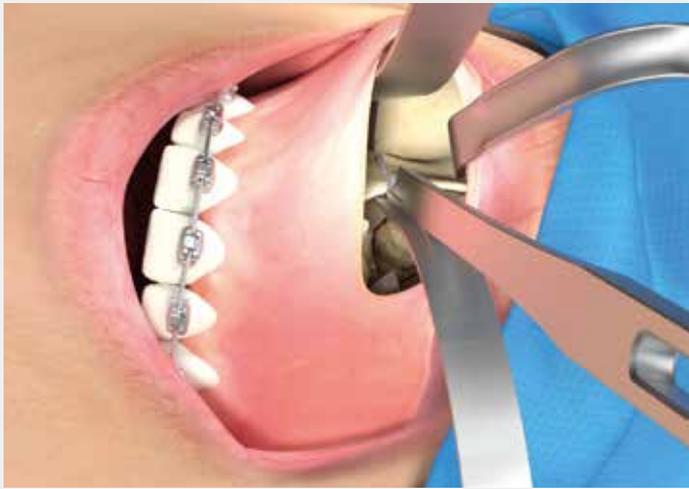
Same procedure at the left side.

6. Le Fort I corticotomy

The operating surgeon is now performing the Le Fort I corticotomy in the subperiosteal tunnel at the right side with an oscillating saw while the soft tissues and infraorbital nerve are protected with soft tissue retractors (Mx2R, RT1 and Mx3).

Same procedure at the left side.



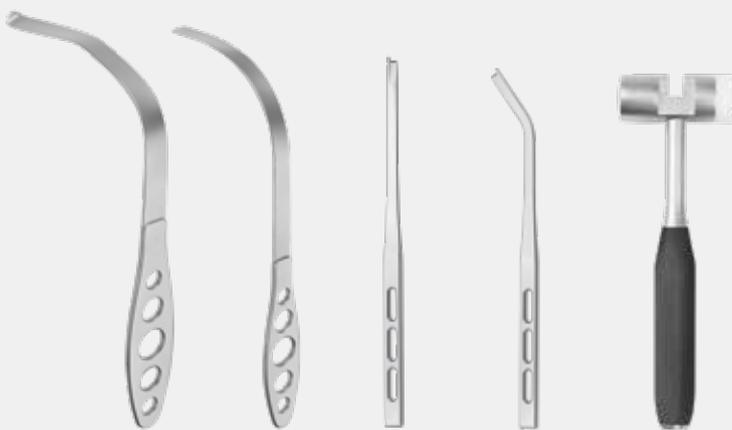


7. Osteotomy of the medial and lateral maxillary walls

The medial and lateral walls of the maxilla are now osteotomized up to the pterygoid plate by the operating surgeon. This is achieved with a straight osteotome (OS2) and curved osteotome (OS3) respectively

The soft tissues are meanwhile protected by the surgical assistant with soft tissue retractors (Mx2R and Mx3).

Same procedure at the left side.



Mx2R hook, twisted, right
 Mx3 spatula
 OS2 osteotome
 OS3 osteotome
 BI-TAP mallet

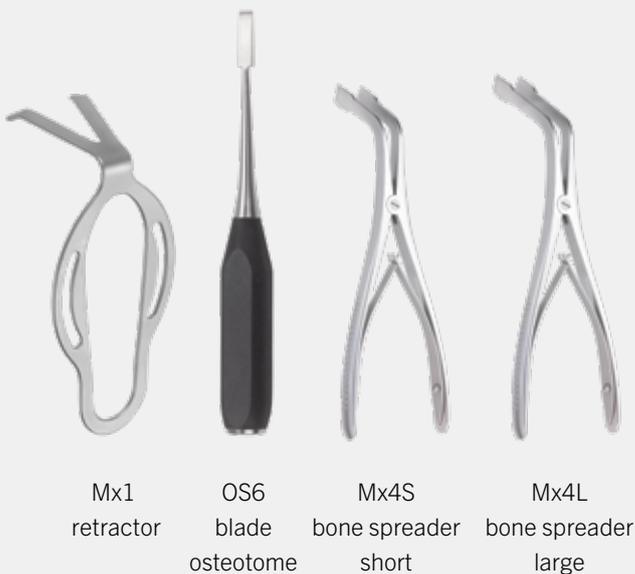


8. Down-fracture and pterygomaxillary (PTM) dysjunction followed by mobilization of the osteotomized maxilla

The osteotomized maxilla is now anteriorly mobilized by the operating surgeon using a sharp 8-mm osteotome (OS6) at the left nasal wall while a short thin spreader (Mx4S) is inserted in the Le Fort I corticotomy at the right nasal wall. It is crucial to down-fracture the maxilla anteriorly only for approximately 8 mm to avoid a transverse fracture in the posterior maxilla.

The pterygomaxillary (PTM) dysjunction is now performed by the operating surgeon by inserting the long thin spreader (Mx4L) in the Le Fort I corticotomy at the level of the infrazygomatic crest. A vertical movement is performed to open the spreader in order to dysjunct the PTM suture followed by a clockwise rotation of the spreader to mobilize the osteotomized maxilla.

Same procedure at the left side.





9. Remodeling of the nasal floor, nasal septum and removal of premature bone contacts

After mobilization the osteotomized maxilla is gently pulled downward with a blunt hook (HK2) by a surgical assistant. The bony septum is removed by the operating surgeon using a septum scissors (Mx5) while the soft tissues are protected by the surgical assistant using a double retractor (Mx1). The septum scissors (Mx5) can be used if further reduction of the cartilage septum is required.

Additional removal of premature bone contacts and remodeling of the nasal floor can be performed with a burr. The soft tissues are protected by the surgical assistant using the double retractor (Mx1) and a blunt double-sided elevator (MI2).



Mx1 retractor



HK2 hooklet



Mx5 septum scissors



MI2 elevator

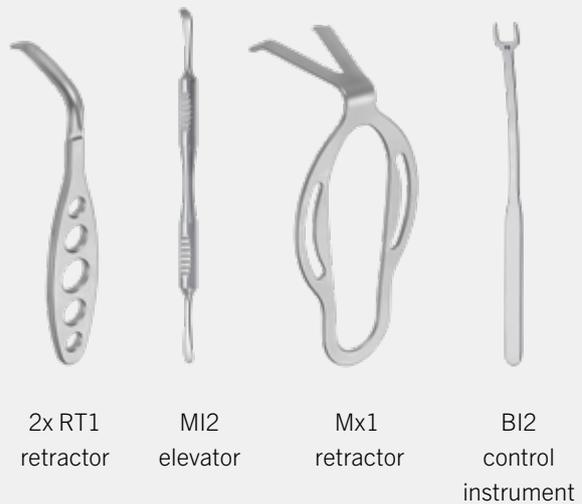


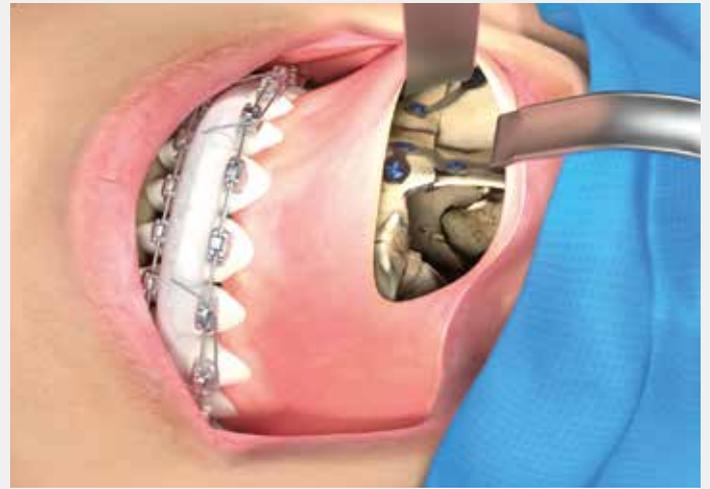
10. Repositioning and fixation of the maxilla in its 3D virtual planned position

The maxilla is repositioned and fixed in its planned position by the operating surgeon with two L-plates at the lateral nasal wall.

During osteosynthesis fixation, vertical repositioning of the osteotomized maxilla can be controlled by a caliper (B11) or control instrument (B12).

Same procedure at the left side.



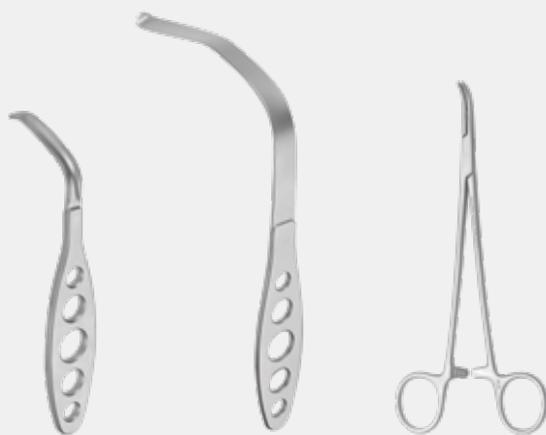


Repositioning and fixation of the maxilla in its 3D virtual planned position

After careful placement of a curved soft tissue retractor (Mx2R) and a small curved soft tissue retractor (RT1), a straight plate with tab is placed by the operating surgeon using a clamp (B13).

Same procedure at the left side.

Finally, double-layer closure with paranasal cross-suturing of the nasolabial muscles is performed by the operating surgeon while the soft tissues are gently hold by the surgical assistants with two small curved soft tissue retractors (2x RT1) and two hooklets (2x HK3).



RT1 retractor

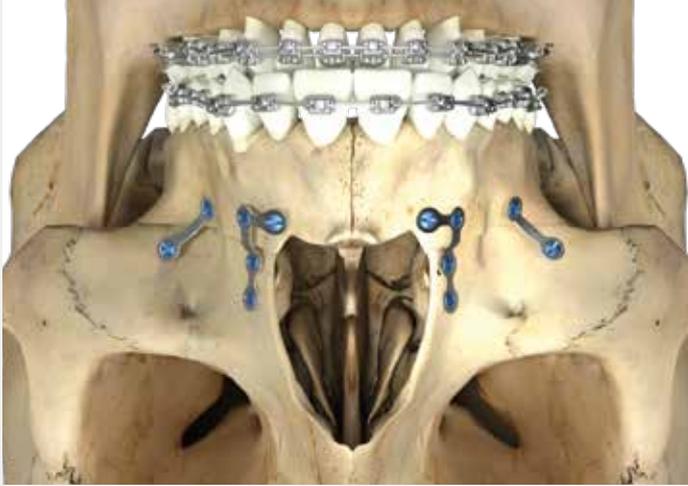
Mx2R hook, twisted, right

B13 clamp



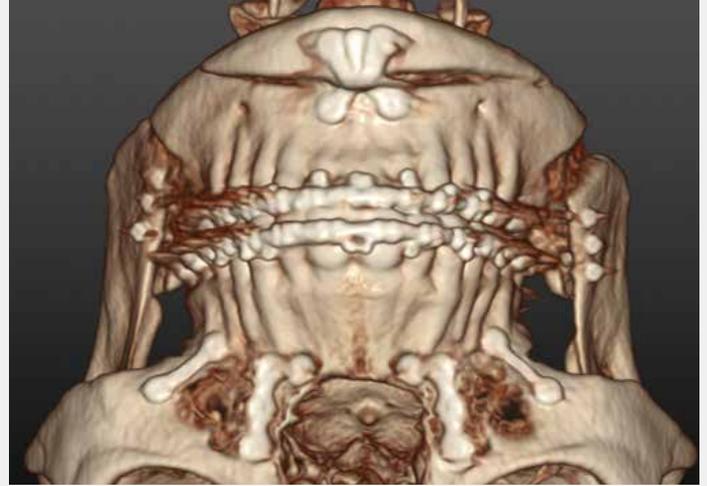
2x RT1 retractor

2x HK3 hooklet, sharp



Standard osteosynthesis

Standard osteosynthesis of the MI Le Fort I osteotomy requires internal fixation utilising two L plates medially and two 2-hole plates with tabs laterally.



Post-surgical quality control

Using the IPS CaseDesigner® a post-surgical quality control is performed of the repositioned maxilla after MI Fort I osteotomy.

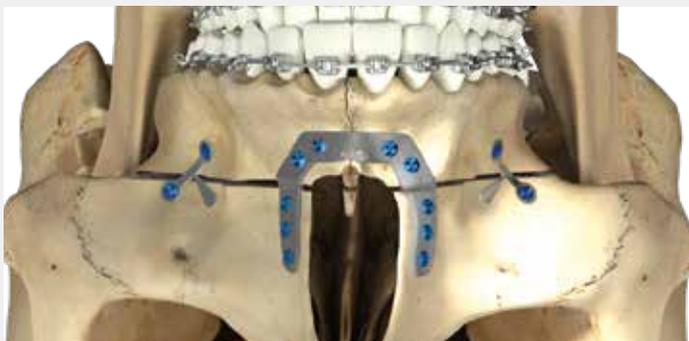
**IPS Implants® MI Orthognathics
can be used alternatively after step 5**



**Repositioning and fixation of the maxilla in its 3D virtual
planned position using a minimally invasive IPS® implant**

A minimally invasive guide is used to transfer the virtually planned Le Fort I corticotomy and position of the maxilla.

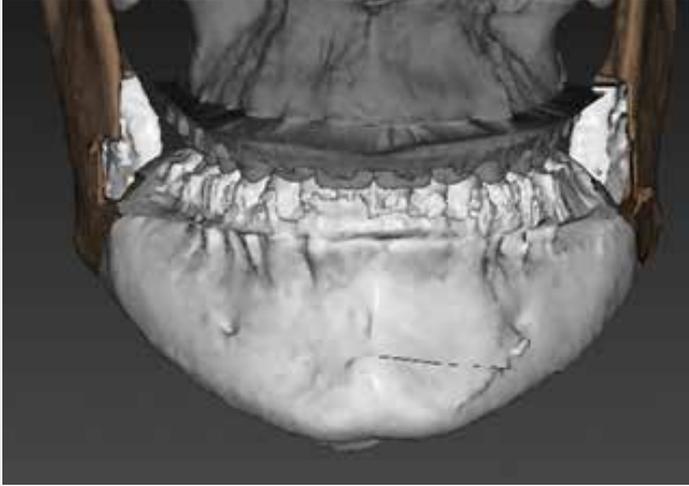
The maxilla is repositioned and fixed in its planned position by the operating surgeon using a minimally invasive IPS® implant bilaterally at the lateral nasal wall.



Two straight plates with tab are additionally placed at the lateral buttress of the maxilla.

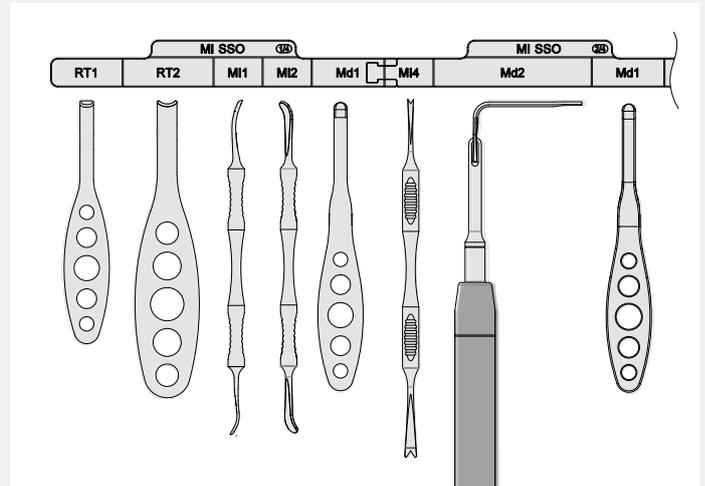


Using the IPS CaseDesigner® a post-surgical quality control is performed of the repositioned maxilla after MI Fort I osteotomy.



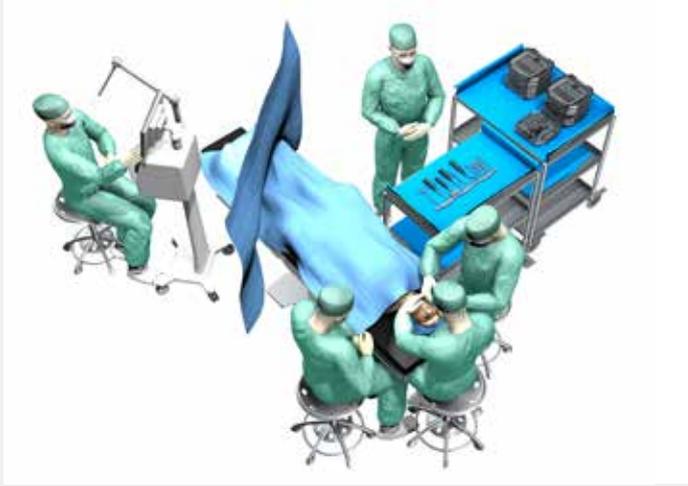
Pre-surgical 3D virtual planning

Using the IPS CaseDesigner® individualized 3D virtual planning of a sagittal split osteotomy is performed in a user-friendly way in the daily clinical routine.



Instrument preparation

The surgical sequence bar is an innovative device to aid the operating nurse in following the MI Sagittal Split procedure. It indicates which L1® MI Orthognathics instruments need to be extracted from the instruments storage container at any given time point of the surgery. The L1® MI Orthognathics surgical codes and sequences are an excellent organization tool and optimizes surgical efficiency in order to decrease patient morbidity.



Patient positioning

To perform a MI Sagittal Split osteotomy, the patient is positioned in a supine position on the operating table. Nasal intubation is performed with the tube positioned in the midline closely adapted to the forehead midline contour of the patient.

The operating surgeon is positioned at the right side of the head of the patient while one surgical assistant is positioned at the left side of the patient's head and the other at the patient's head.

In the ideal setting, the anaesthesiologist is positioned at the left side of the patient's feet while the surgical nurse is positioned at the right side of the patient's thorax.



Surgeon's view

The following MI Sagittal Split osteotomy is shown from the surgeon's perspective.



1. Soft tissue approach to the sagittal split osteotomy (SSO) of the mandible

The MI approach towards a sagittal split osteotomy (SSO) starts by gently placing small (RT1) and large (RT2) soft tissue retractors by the surgical assistants to retract the soft tissues of the lower jaw. Using a 15 scalpel, the operating surgeon starts the mucosal incision at approximately 1 cm behind the second molar. The incision then continues perpendicular on the bone up to the distal level of the first lower molar.

2. Access towards the buccal corticotomy of the horizontal mandibular ramus

Using a sharp raspatorium (MI1) a subperiosteal tunnel is created by a sliding movement towards the antegonial notch.



RT1
retractor



RT2
retractor, large



RT1
retractor



RT2
retractor, large



MI1
raspatory



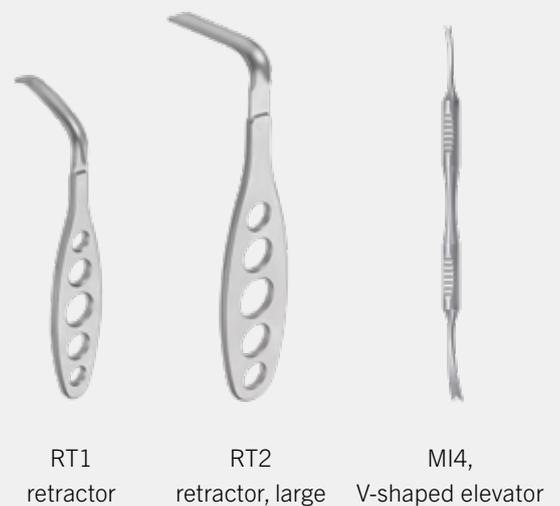
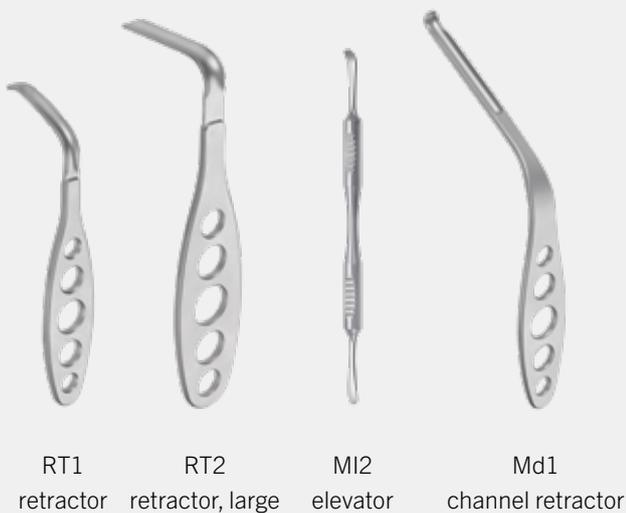
3. Buccal corticotomy of the horizontal mandibular ramus

The operating surgeon retracts the soft tissues with a blunt elevator (MI2) and inserts a small channel retractor (Md1) following a strict subperiosteal path towards the antegonial notch. Consecutively, a buccal corticotomy is performed with a Lindemann burr.



4. Retromolar degloving

Using a V-shaped elevator (MI4) the soft tissues are elevated on the vertical mandibular ramus up to the insertion of the temporalis muscle.





5. Access towards the lingual corticotomy of the vertical mandibular ramus

After retromolar degloving, a ramus hook (Md2) is placed by the surgical assistant. While gently retracting the soft tissues lingually using a blunt elevator (MI2), the operating surgeon creates a subperiosteal tunnel by a sliding movement using a sharp raspatorium (MI1) above the lingula.

6. Lingual corticotomy of the vertical mandibular ramus

The operating surgeon retracts the soft tissues with a blunt elevator (MI2) and inserts a small channel retractor (Md1) above the lingula following a strict subperiosteal path in order to protect the inferior alveolar nerve. Subsequently, a lingual corticotomy is performed with a Lindemann burr behind the lingula or to the posterior border of the vertical mandibular ramus.



RT1 retractor MI1 raspatory MI2 elevator Md2 ramus hook



RT1 retractor MI2 elevator Md1 channel retractor



7. Completion of the sagittal split osteotomy (SSO)

The operating surgeon now connects the lingual and buccal corticotomy along the buccal cortex with a short Lindemann burr.

Using a thin osteotome (OS4), the lingual osteotomy is initiated behind the lingula followed by completion of the sagittal split osteotomy (SSO) by the operating surgeon with a wedge osteotome (OS5) and a mallet (BI-TAP) while the mandibular lower border is supported by one of the surgical assistants using a small channel retractor (Md1).



2x Md1
channel
retractor

Md2
ramus hook

OS4
osteotome

BI-TAP
mallet

OS5
wedge
osteotome



8. Mobilization of the mandibular segments after sagittal split osteotomy

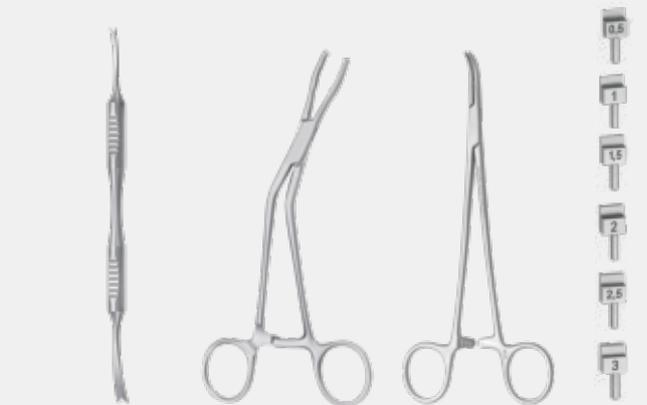
The proximal mandibular segment is now further released and mobilized by the operating surgeon using a wedge-osteotome (OS5) and an 8 mm sharp osteotome (OS6).

9. Tri-vector seating of the mandibular proximal segment

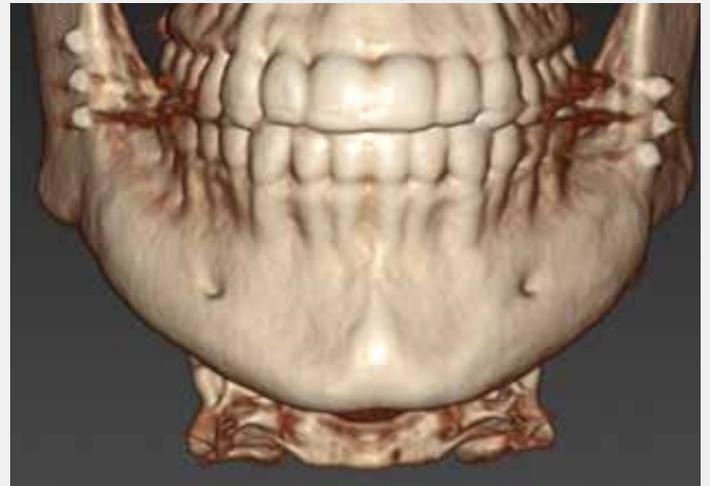
The proximal segment is now seated in centric relation by the operating surgeon using a V-shaped elevator (MI4) and a bone holding forceps (Md3). To avoid torque on the condyle, a MI spacer (Md4-9) can be placed in between the proximal and distal mandibular fragments.



Md1 channel retractor
Md2 ramus hook
OS5 wedge osteotome
OS6 blade osteotome



MI4, V-shaped elevator
Md3 bone holding forceps
BI3 clamp
Md4-9 spacer



10. Rigid Fixation of the sagittal split osteotomy

The proximal and distal mandibular fragments are fixed in their planned position using bi-cortical screws, mini-plate osteosynthesis or a combination. Finally, closure of the wound is performed.

Postoperative quality control

Using the IPS CaseDesigner® a post-surgical quality control is performed of the repositioned mandible after sagittal split osteotomy (SSO).



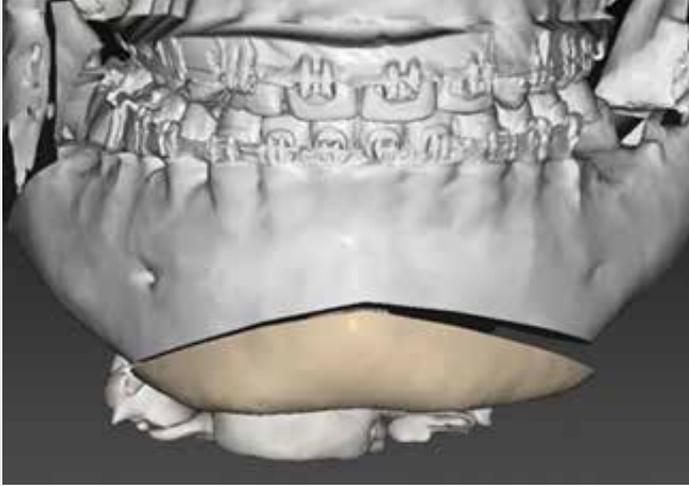
RT1
retractor



RT2
retractor, large

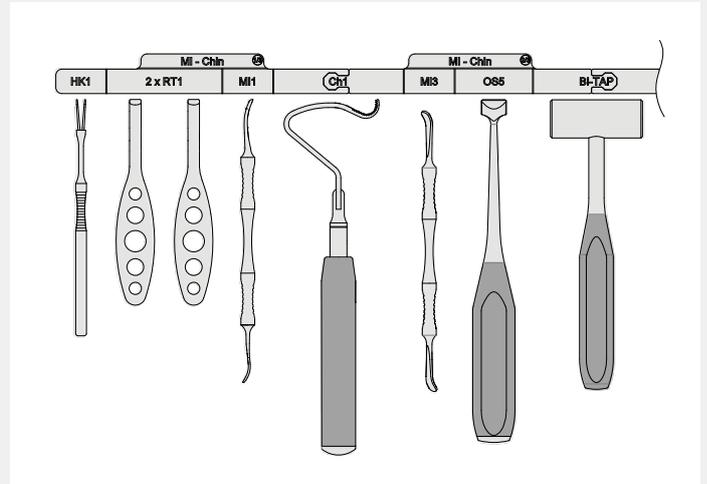


Md3
bone holding
forceps



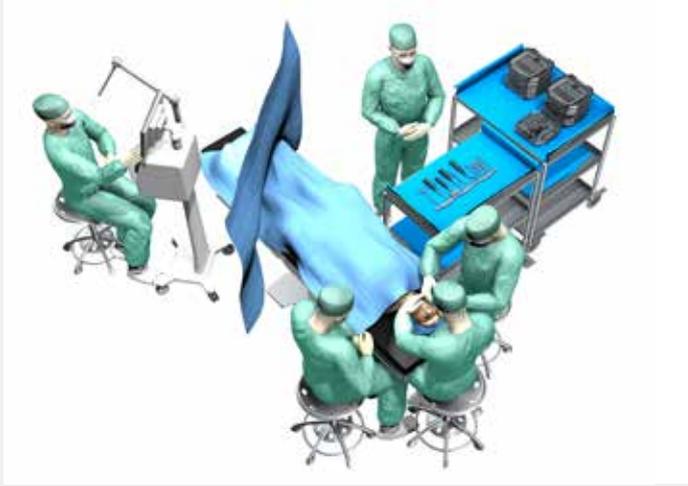
Pre-surgical 3D virtual planning

Using the IPS CaseDesigner® individualized 3D virtual planning of a chin osteotomy is performed in a user-friendly way in the daily clinical routine.



Instrument preparation

The surgical sequence bar is an innovative device to aid the operating nurse in following the MI Chin procedure. It indicates which L1® MI Orthognathics instruments need to be extracted from the instruments storage container at any given time point of the surgery. The L1® MI Orthognathics surgical codes and sequences are an excellent organization tool and optimizes surgical efficiency in order to decrease patient morbidity.



Patient positioning

To perform a MI Chin osteotomy, the patient is positioned in a supine position on the operating table. Nasal intubation is performed with the tube positioned in the midline closely adapted to the forehead midline contour of the patient.

The operating surgeon is positioned in front of the patient's head while two surgical assistants are positioned laterally at both sides of the head of the patient.

In the ideal setting, the anaesthesiologist is positioned at the left side of the patient's feet while the surgical nurse is positioned at the right side of the patient's thorax.



Surgeon's view

The following MI Chin osteotomy is shown from the surgeon's perspective.



1. Soft tissue approach to the chin

The MI approach towards a chin osteotomy starts by gently placing a soft tissue double hook (HK1) by the operating surgeon in the midline of the mucosa of the lower lip close to its border.

Consecutively, two small curved soft tissue retractors (2x RT1) are placed by the two surgical assistants to retract the soft tissues of the lower lip. Note that it is crucial that the operating surgeon (in front of the patient) verifies the symmetrical positioning of both the soft tissue double hook (HK1) and both soft tissue retractors (2x RT1) before proceeding.

2. Access towards the bony chin

A mucosal incision is made using a 15 scalpel in the high mucosa of the lower lip following its outer contour, followed by gentle submucosal dissection of a vestibular mucosal flap identifying the mentalis muscles.

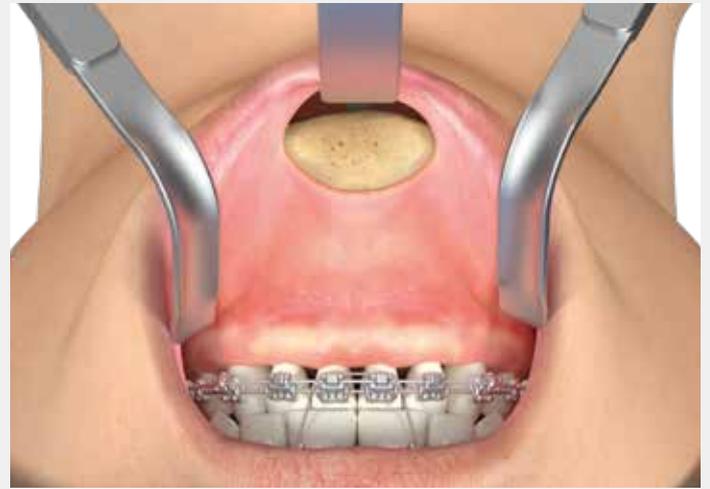
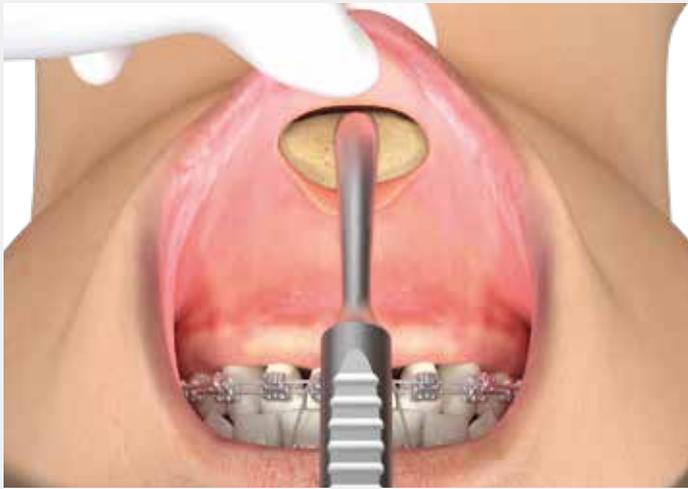
Consecutively, the deep layers are incised through the periosteum on the chin bone using a 15 scalpel, approximately 5 mm below the mucosal incision allowing a good muscle bulk for final double layer closure of the wound.



HK1
skin hooklet



2x RT1
retractor



3. Exposure of the bony chin

Precise subperiosteal degloving is now performed in the chin midline using a sharp raspatorium (MI1) by the operating surgeon while supporting the chin with his other hand. The subperiosteal degloving is performed by a sliding movement towards the chin symphysis.

Subsequently, a chin holder (Ch1) is inserted at the mandibular symphyseal border by following a strict subperiosteal path.

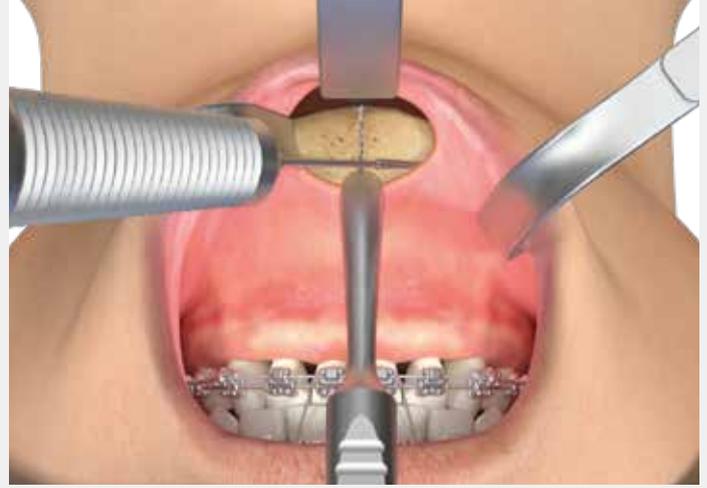
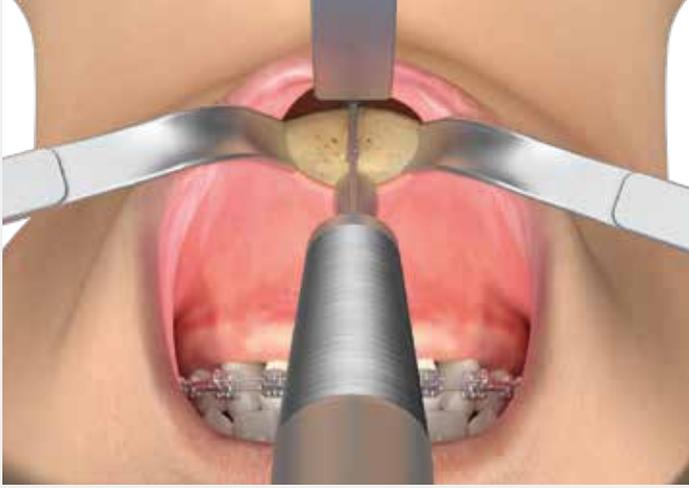


MI1
raspatory



2x RT1
retractor

Ch1
chin holder



4. Marking the skeletal chin midline towards the lower dental midline

Using a 1-mm fissure burr, the skeletal chin midline is marked towards the lower dental midline, while the soft tissues are protected using a raspatorium (MI1) by the operating surgeon and two small soft tissue retractors (2x RT1) by both surgical assistants. The chin is meanwhile supported by the chin holder (Ch1).

5. Marking the horizontal reference line in the midline

Using a 1-mm fissure burr, the central part of the chin osteotomy is marked by the operating surgeon. One surgical assistant is supporting the chin with the chin retractor (Ch1) and protecting the soft tissues at the right side with a small soft tissue retractor (RT1), while the other surgical assistant is protecting the soft tissues at the left side using another small soft tissue retractor (RT1).

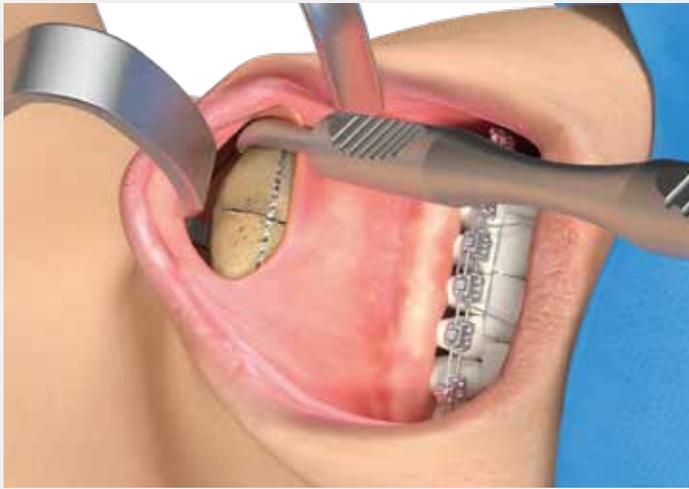
Same procedure at the left side.



2x RT1 retractor MI1 raspatory Ch1 chin holder



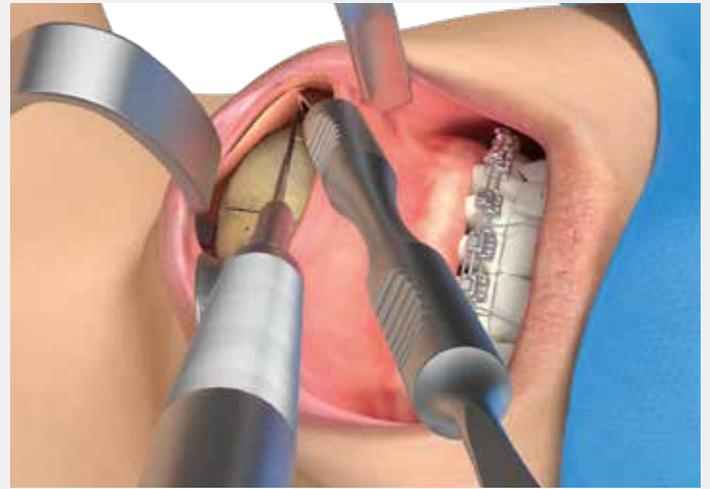
2x RT1 retractor MI1 raspatory Ch1 chin holder



6. Exposure of the unilateral bony chin by subperiosteal tunneling

Once, the operating surgeon has made a subperiosteal tunnel with a raspatorium (MI1) below the right foramen mentale, a twisted elevator (MI3) is placed in the subperiosteal tunnel.

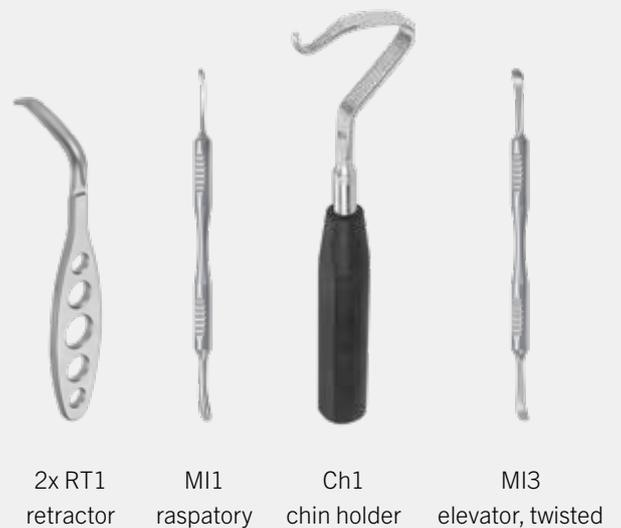
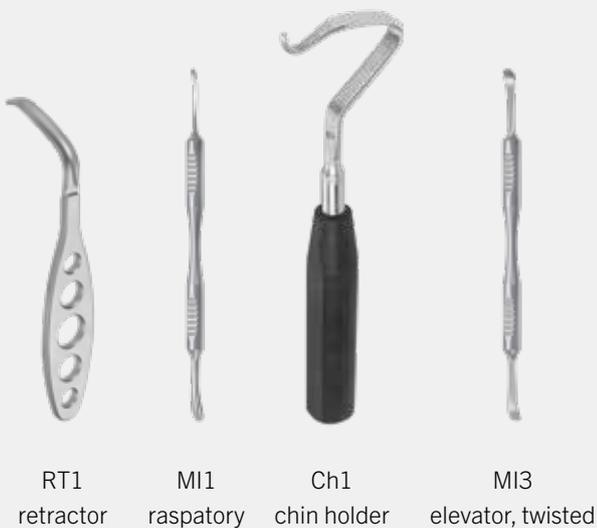
Same procedure at the left side.

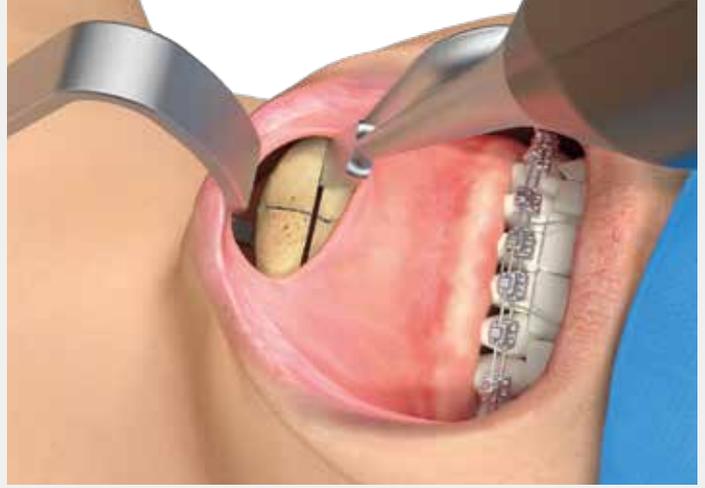
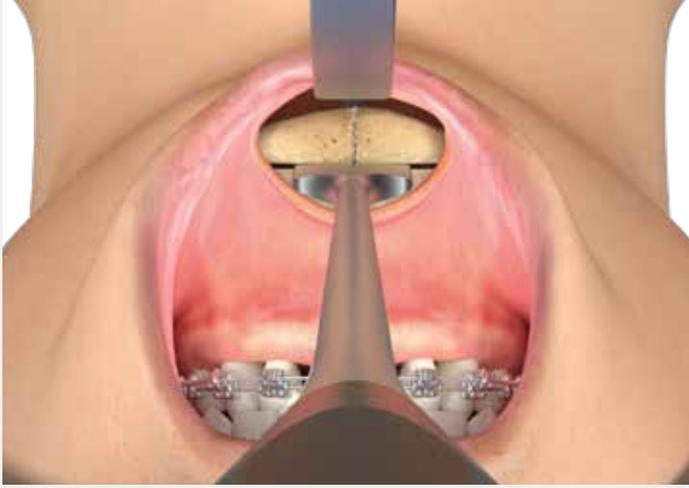


7. Chin osteotomy

The operating surgeon is now performing the chin osteotomy in the subperiosteal tunnel at the right side protecting both the mentalis nerve and soft tissues at the mandibular lower border with the twisted elevator (MI3). The surgical assistants are meanwhile supporting the chin with the chin holder (Ch1) and protecting the soft tissues at the left side with a small soft tissue retractor (RT1).

Same procedure at the left side.





8. Completion of the chin osteotomy

Using a wedge osteotome (OS5) and a mallet (BI-TAP), the chin osteotomy is now completed by the operating surgeon while the chin is supported by the chin holder (Ch1) by one of the surgical assistants.

9. Mobilization of the bony chin after osteotomy

The osteotomized chin can now be further mobilized by the operating surgeon using an 8 mm sharp osteotome (OS6) if necessary.



Ch1
chin holder

OS5
wedge osteotome

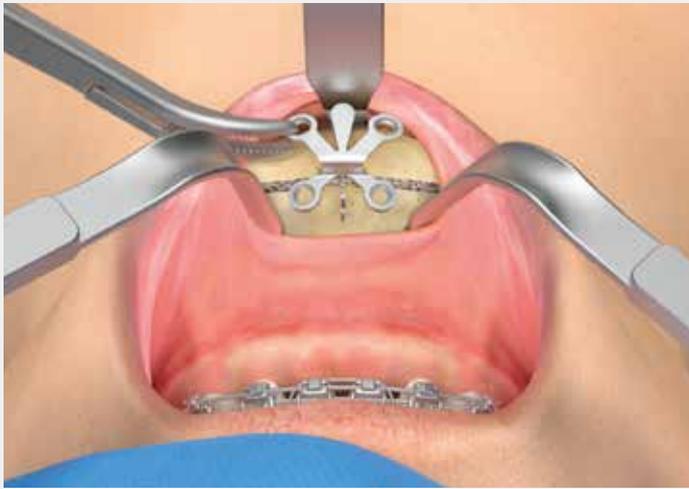
BI-TAP
mallet



Ch1
chin holder

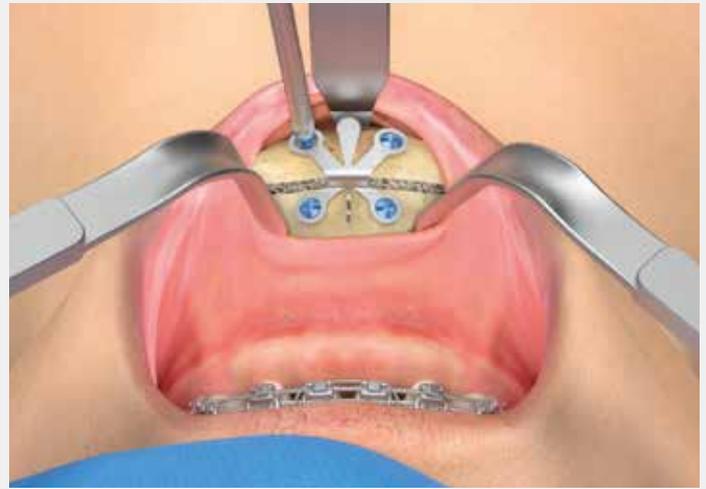
OS6
blade osteotome

RT1
retractor



10. Repositioning and rigid fixation of the chin in its planned position

The chin is repositioned and fixed in its planned position using a pre-bent osteosynthesis plate held by the operating surgeon using a clamp (BI3). Finally, a double-layer closure of the wound is performed.



Post-surgical quality control

Using the IPS CaseDesigner® a post-surgical quality control is performed of the repositioned chin.



2x RT1 retractor



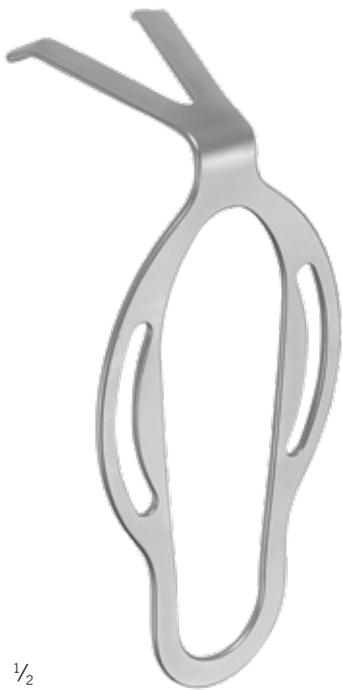
Ch1 chin holder



BI3 clamp

Instruments L1® MI Orthognathics

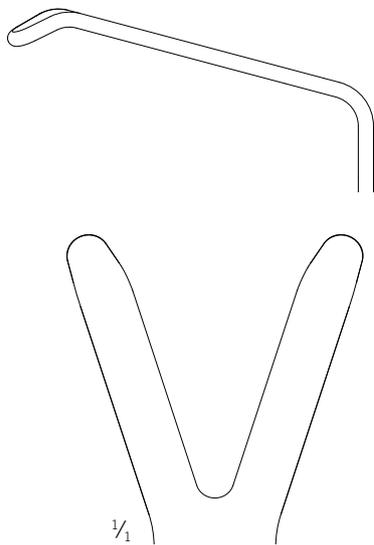
Instrument Group Mx - Maxilla



1/2

38-684-05-07
14 cm / 5 5/8"
Mx1, retractor, double

St 1



1/1

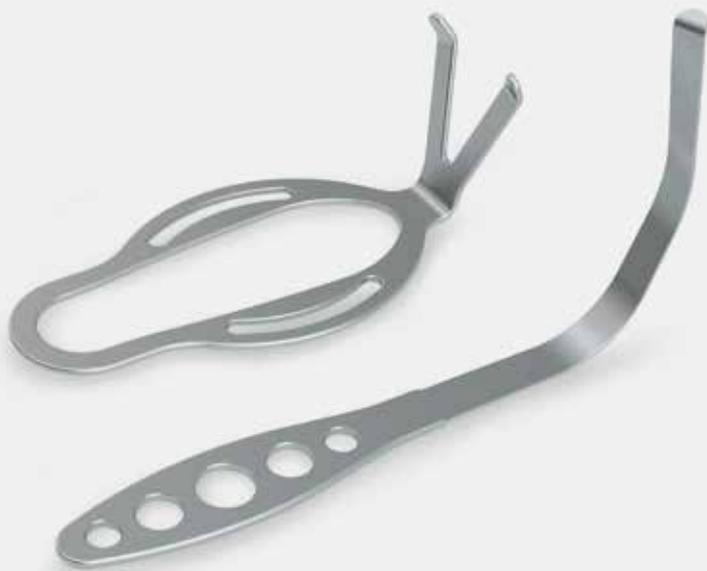


1/1

1/2

38-684-06-07
16.5 cm / 6 5/8"
Mx2L, hook, twisted, left

St 1



Explanation of icons

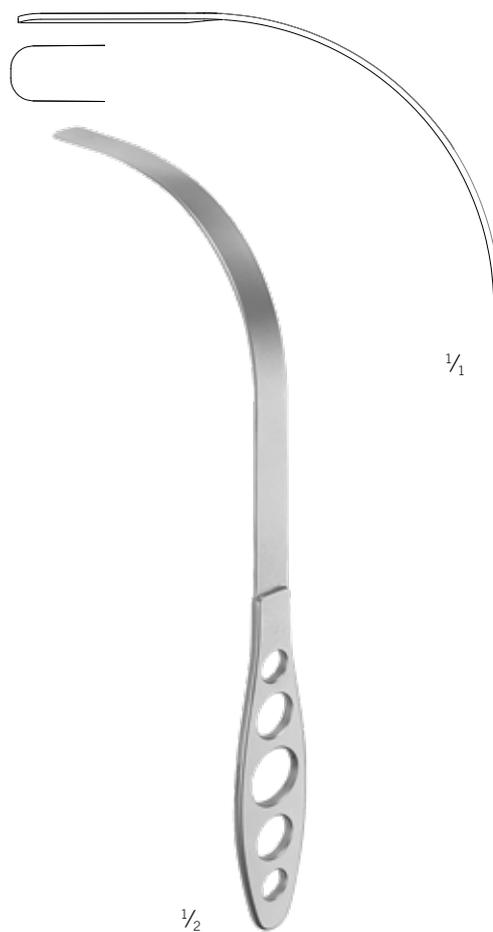
St Steel

1 Units per package



38-684-07-07
16.5 cm / 6 5/8"
Mx2R, hook, twisted, right

St 1



38-684-08-01
16 cm / 6 3/8"
Mx3, spatula, curved

St 1

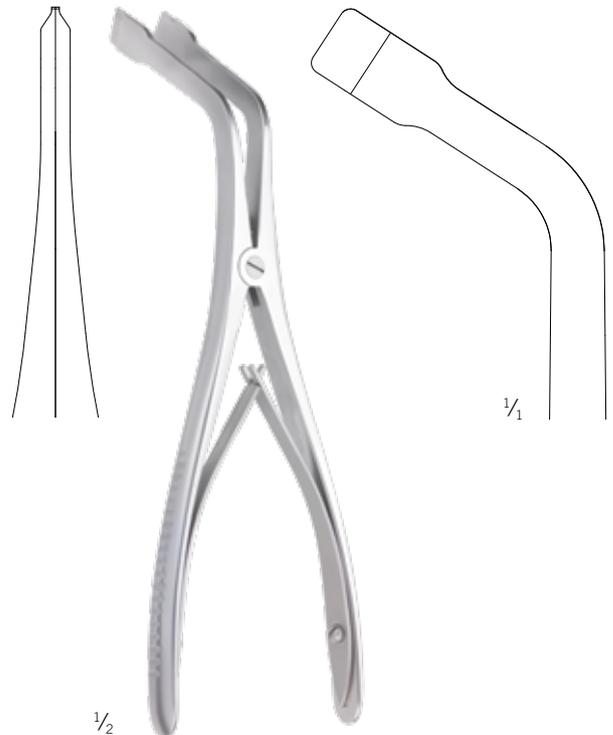
Instruments L1® MI Orthognathics

Instrument Group Mx - Maxilla



38-684-09-07
18 cm / 7 1/8"
Mx4S, bone expander
short

St 1



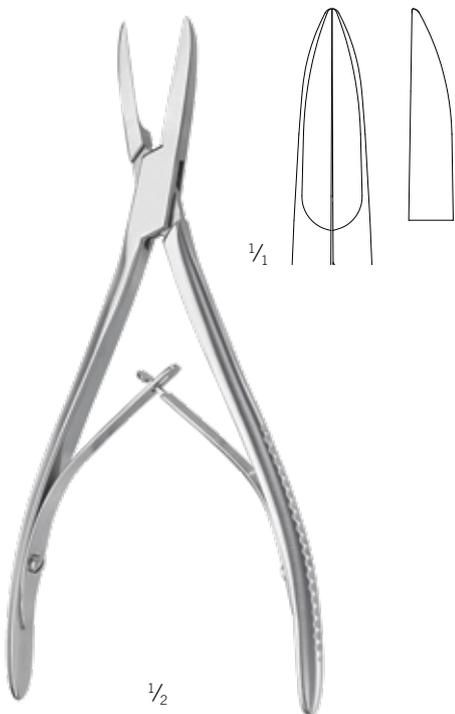
38-684-10-07
18.5 cm / 7 3/8"
Mx4L, bone expander
long

St 1



Explanation of icons

- St** Steel
- 1** Units per package

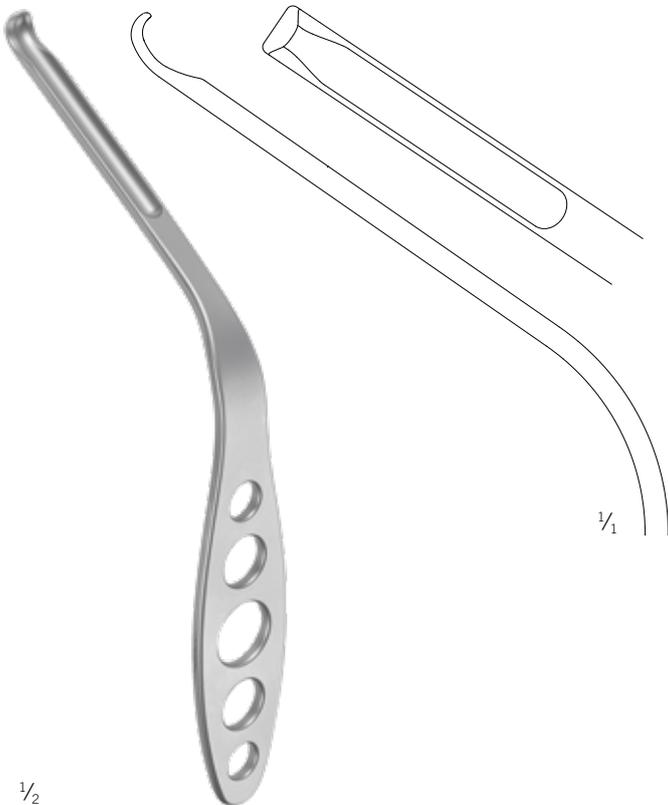


38-684-11-07
 18.5 cm / 7 3/8"
 Mx5, septum scissors

St 1

Instruments L1® MI Orthognathics

Instrument Group Md – Mandible



$\frac{1}{2}$

38-684-12-07

16 cm / 6 $\frac{3}{8}$ "

Md1, channel retractor

St 1



$\frac{1}{2}$

38-684-13-04

23 cm / 9 $\frac{1}{8}$ "

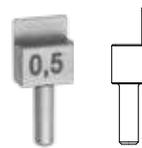
Md2, ramus hook

St Sic 1



Explanation of icons

- St** Steel
- Sic** Silicone
- 1** Units per package



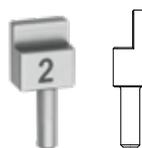
38-684-15-07
Md4, spacer 0.5 mm



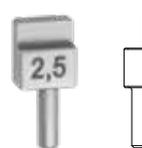
38-684-16-07
Md5, spacer 1.0 mm



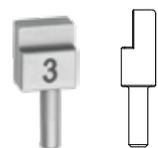
38-684-17-07
Md6, spacer 1.5 mm



38-684-18-07
Md7, spacer 2.0 mm



38-684-19-07
Md8, spacer 2.5 mm



38-684-20-07
Md9, spacer 3.0 mm

38-684-14-07
19 cm / 7 5/8"
Md3, bone holding forceps

St **1**

Instruments **L1**® MI Orthognathics

Instrument Group Ch - Chin



38-684-21-04

23 cm / 9 1/8"

Ch1, chin holder

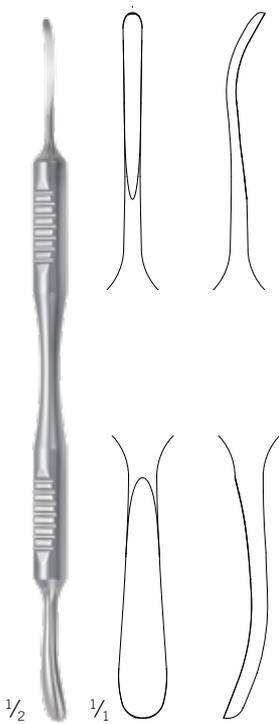
St Sic 1



Explanation of icons

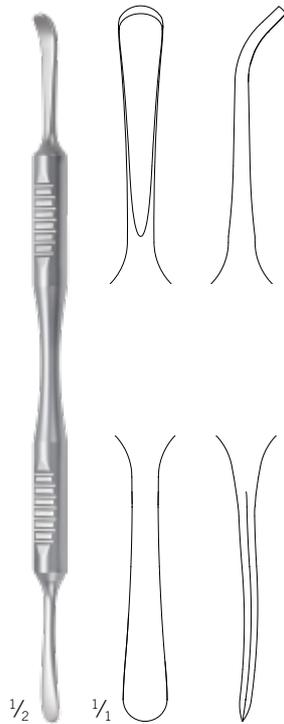
- St** Steel
- Sic** Silicone
- 1** Units per package

Instrument Group MI – Minimally Invasive



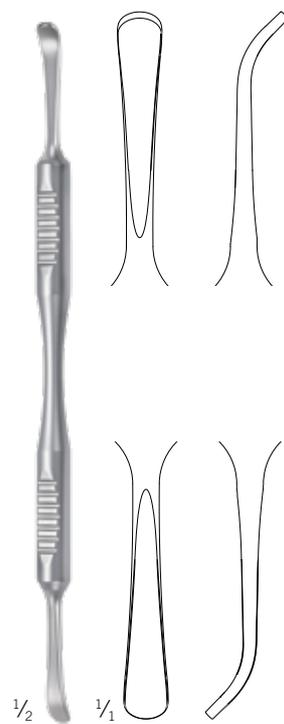
38-684-22-07
18.5 cm / 7 3/8"
MI1, raspatory
double-sided

St 1



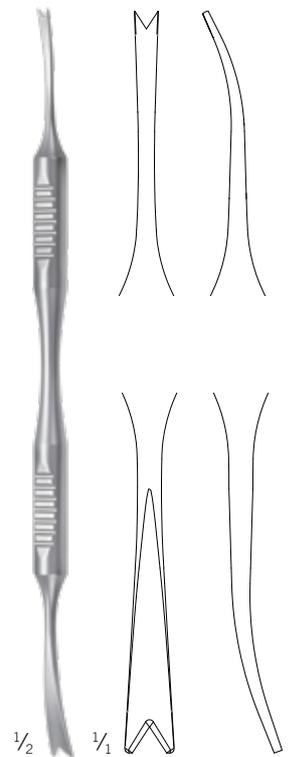
38-684-23-07
18.5 cm / 7 3/8"
MI2, elevator
double-sided

St 1



38-684-24-07
18.5 cm / 7 3/8"
MI3, elevator
twisted

St 1



38-684-25-07
20 cm / 7 7/8"
MI4, V-shaped elevator

St 1

Instruments L1® MI Orthognathics

Instrument Group RT - Retractors

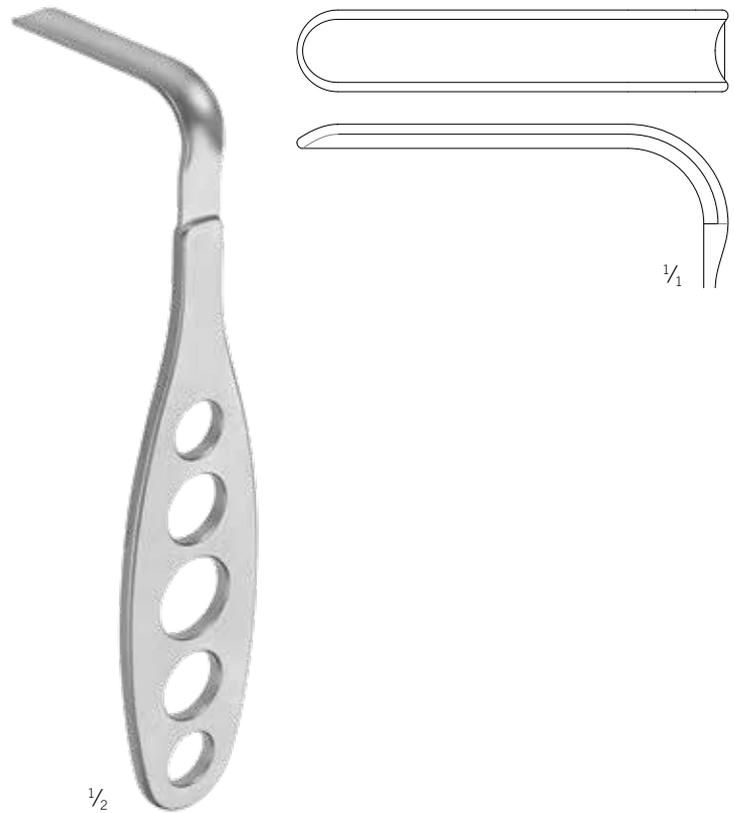


38-684-27-01

13.5 cm / 5 3/8"

RT1, retractor
curved

St 1



38-684-28-01

16.5 cm / 6 5/8"

RT2, retractor
large

St 1



Explanation of icons

St Steel

1 Units per package

Instrument Group HK – Hooks



38-684-30-07

15.5 cm / 6 1/8"

HK1, skin hooklet
doubled

St 1



38-684-31-07

18 cm / 7 1/8"

HK2, hooklet,
curved, blunt

St 1



38-684-29-07

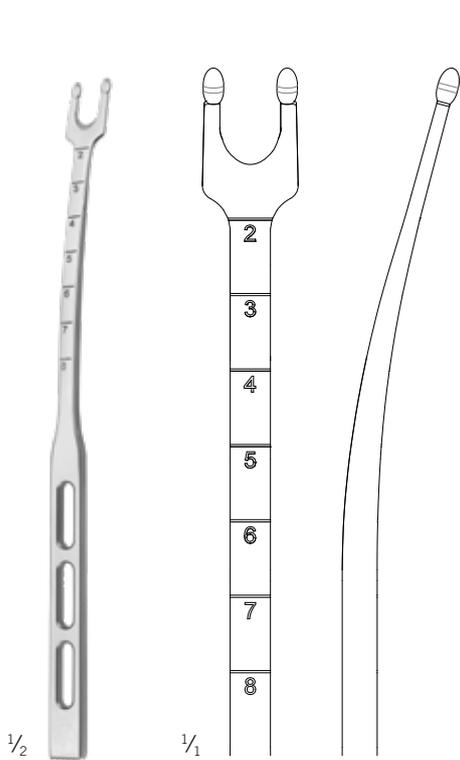
18 cm / 7 1/8"

HK3, hooklet
sharp

St 1

Instruments L1® MI Orthognathics

Instrument Group OS – Osteotomes



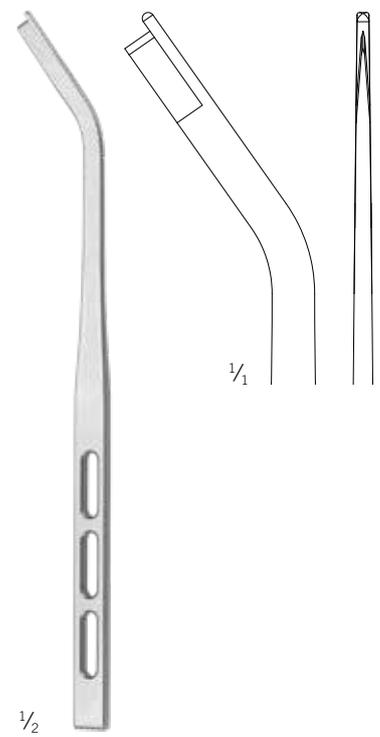
38-684-33-07
18.5 cm / 7 3/8"
OS1, septum osteotome
8 mm

St 1



38-684-34-07
19.5 cm / 7 7/8"
OS2, osteotome
4 mm, straight

St 1



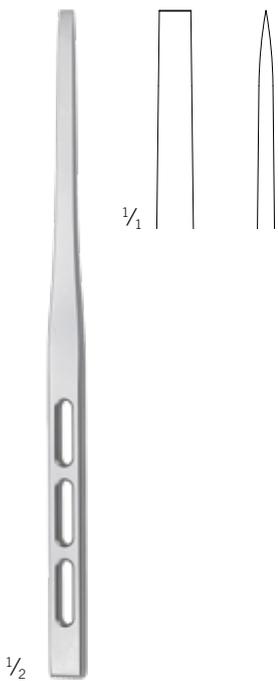
38-684-35-07
19 cm / 7 1/2"
OS3, osteotome
4 mm, curved

St 1



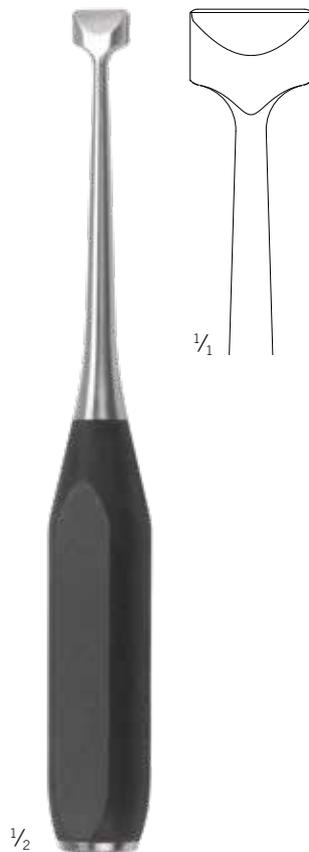
Explanation of icons

- St** Steel
- Sic** Silicone
- 1** Units per package



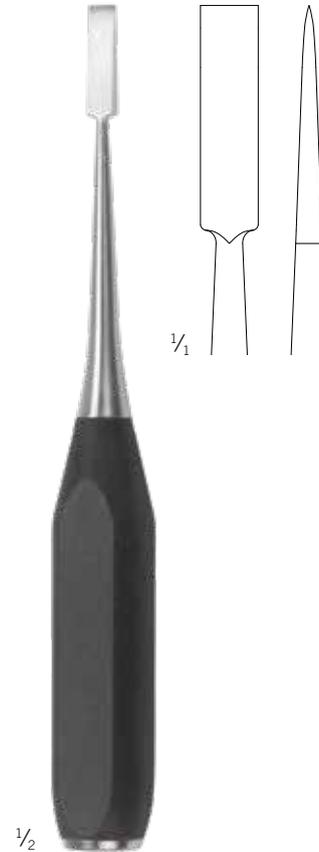
38-684-32-07
17.5 cm / 6 7/8"
OS4, osteotome
4 mm, thin

St **1**



38-684-37-04
22.5 cm / 8 7/8"
OS5, wedge osteotome
16 mm, blunt

St **Sic** **1**

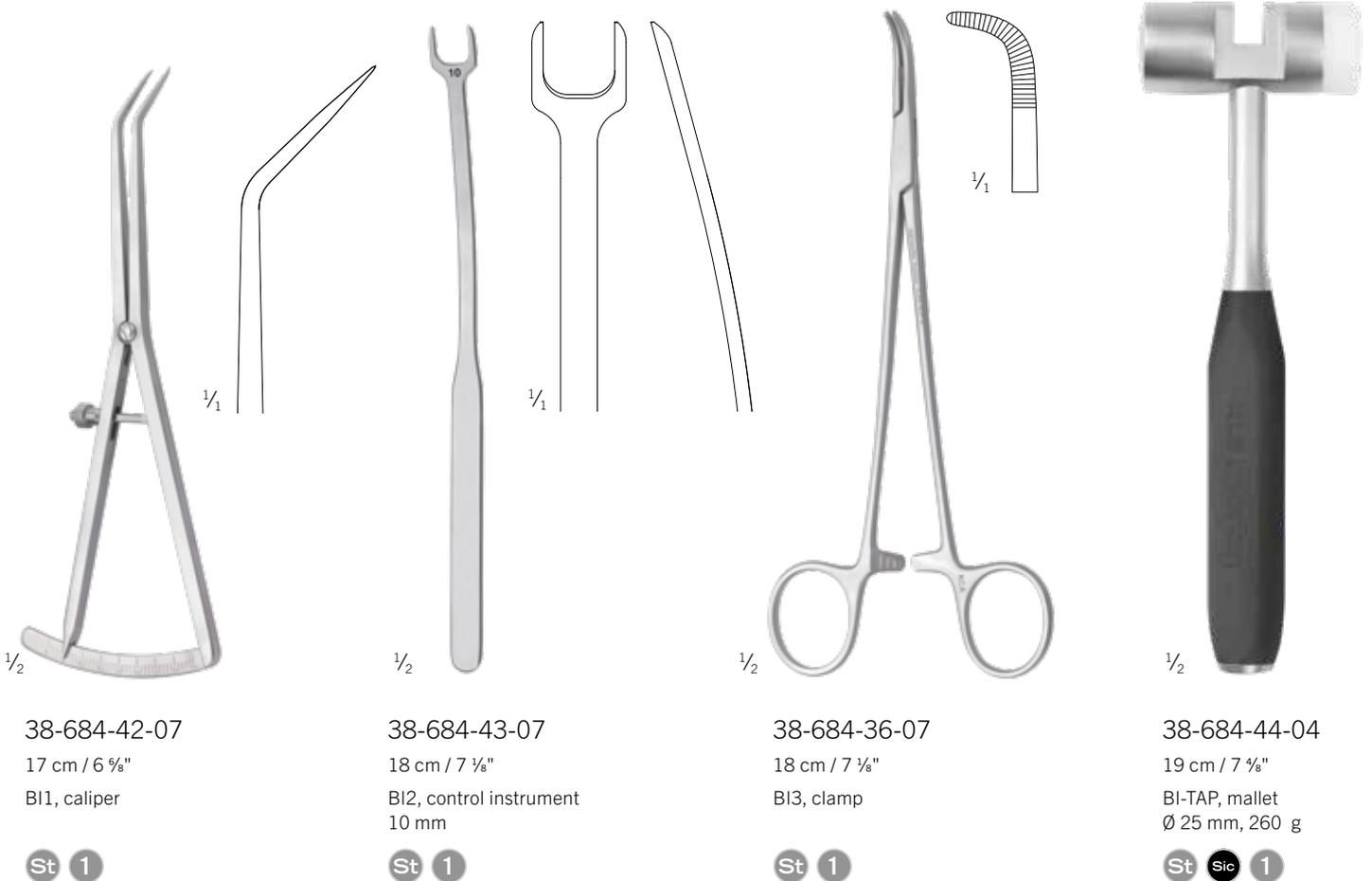


38-684-38-04
22.5 cm / 8 7/8"
OS6, blade osteotome
8 mm

St **Sic** **1**

Instruments L1® MI Orthognathics

Instrument Group BI - Basic Instruments





Explanation of icons

- St** Steel
- Sic** Silicone
- 1** Units per package

Sequence Bars – MI Le Fort I Osteotomy



38-684-45-07

MI SEQ1, sequence bar MI LeFort I part 1

St 1



38-684-46-07

MI SEQ2, sequence bar MI LeFort I part 2

St 1



38-684-47-07

MI SEQ3, sequence bar MI LeFort I part 3

St 1



38-684-48-07

MI SEQ4, sequence bar MI LeFort I part 4

St 1



38-684-49-07

MI SEQ5, sequence bar MI LeFort I part 5

St 1



38-684-50-07

MI SEQ6, sequence bar MI LeFort I part 6

St 1

Instruments **L1**® MI Orthognathics

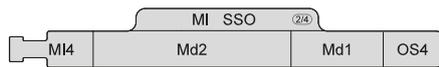
Sequence Bars – MI Sagittal Split Osteotomy



38-684-51-07

MI SEQ7, sequence bar MI Sagittal Split part 1

St 1



38-684-52-07

MI SEQ8, sequence bar MI Sagittal Split part 2

St 1



38-684-53-07

MI SEQ9, sequence bar MI Sagittal Split part 3

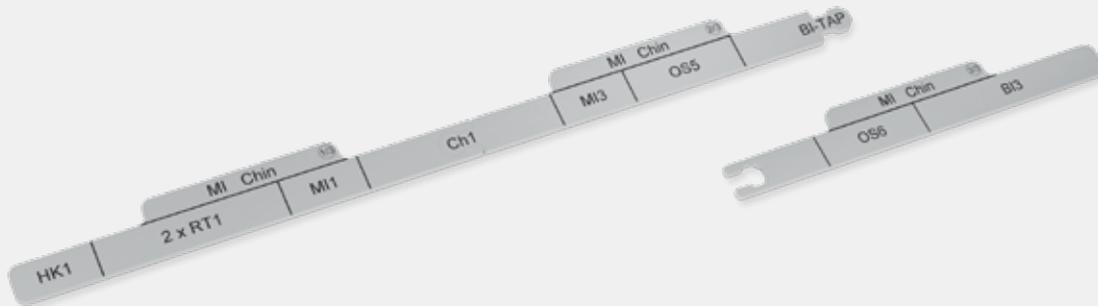
St 1



38-684-54-07

MI SEQ10, sequence bar MI Sagittal Split part 4

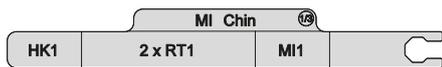
St 1



Explanation of icons

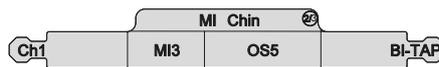
- St** Steel
- 1** Units per package

Sequence Bars – MI Chin Osteotomy



38-684-55-07
MI SEQ11, sequence bar MI Chin
part 1

St **1**



38-684-56-07
MI SEQ12, sequence bar MI Chin
part 2

St **1**

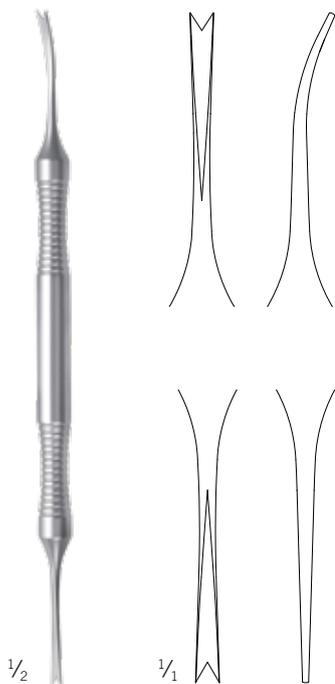


38-684-57-07
MI SEQ13, sequence bar MI Chin
part 3

St **1**

Instruments L1® MI Orthognathics

Optional Instruments

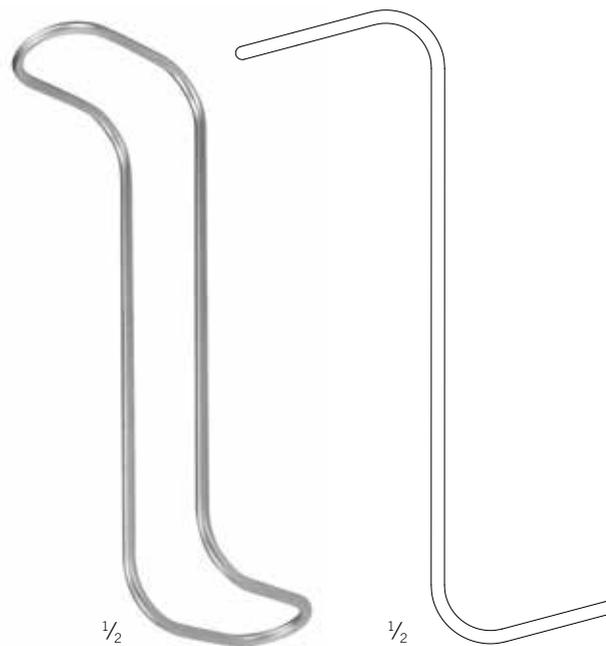


38-684-39-07

18 cm / 7 1/8"

Luniatschek, double-sided

St 1



38-684-40-01

17 cm / 6 5/8"

cheek retractor

St 1



Explanation of icons

- St** Steel
- 1** Units per package



38-684-41-07
15.5 cm / 6 1/8"
cutting pliers
max. t=0.6 mm

St 1



22-500-11-07
15.5 cm / 6 1/8"
TC-wire twisting forceps

St 1 TC GOLD



31-881-90-98
5.5 cm
inner Ø 7 mm / outer Ø 10 mm
hose pair for Mx2, Mx3

Storage L1® MI Orthognathics

L1® MI Orthognathics comprises of two instrument storage containers.

Both storage containers are based on a drawer design. Set 1 has four drawers and Set 2 has three drawers. As a result, all 34 instruments can be stored according to their marking. In addition, an open storage space enables the addition of more instruments to suit custom requirements.

The necessary sequence template is always the first to be removed from instrument set 1 in the SEQ drawer. Together with the sequence template the instruments required for the particular intervention can be removed from the storage container and arranged according to the surgical workflow.

Storage baskets and drawer inserts can be ordered separately or as a complete storage container set.



55-990-65-04 Instrument storage container 1, complete, comprised of:

- 55-990-66-04 Instrument storage container 1 – without drawers
- 55-990-67-04 Instrument drawer insert 1.1 – instrument groups OS and Ch
- 55-990-68-04 Instrument drawer insert 1.2 – instrument groups HK and MI
- 55-990-69-04 Instrument drawer insert 1.3 – instrument groups RT and Md
- 55-990-70-04 Instrument drawer insert 1.4 – instrument group SEQ
- 55-990-71-04 Insert spacer Md4-Md9

55-990-72-04 Instrument storage container 2, complete, comprised of:

- 55-990-73-04 Instrument storage container 2 – without drawers
- 55-990-74-04 Instrument drawer insert 2.1 – instrument group BI
- 55-990-75-04 Instrument drawer insert 2.2 – instrument group Mx
- 55-990-76-04 Instrument drawer insert 2.3 – free storage space



55-990-66-04
Housing - container 1



55-990-67-04
Drawer insert 1.1
OS and Ch



55-990-68-04
Drawer insert 1.2
HK and MI



55-990-69-04
Drawer insert 1.3
RT and Md



55-990-70-04
Drawer insert 1.4
SEQ



55-990-73-04
Housing - container 2



55-990-74-04
Drawer insert 2.1
Group BI



55-990-75-04
Drawer insert 2.2
Group Mx



55-990-76-04
Drawer insert 2.3
free storage space

Recommended set configuration

L1® MI Orthognathics

Instrument Group Mx - Maxilla		
38-684-05-07	MI Mx1, retractor, doubled, 14 cm	1 piece
38-684-06-07	MI Mx2L, hook, twisted, left, 16.5 cm	1 piece
38-684-07-07	MI Mx2R, hook, twisted, right, 16.5 cm	1 piece
38-684-08-01	MI Mx3, spatula, curved, 16 cm	1 piece
38-684-09-07	MI Mx4S, bone expander, short, 18 cm	1 piece
38-684-10-07	MI Mx4L, bone expander, long, 18.5 cm	1 piece
38-684-11-07	MI Mx5, septum scissors, 18.5 cm	1 piece
Instrument Group Md - Mandible		
38-684-12-07	MI Md1, channel retractor, 16 cm	2 pieces
38-684-13-04	MI Md2, ramus hook, 23 cm	1 piece
38-684-14-07	MI Md3, bone holding forceps, 19 cm	1 piece
38-684-15-07	MI Md4, spacer 0.5 mm	1 piece
38-684-16-07	MI Md5, spacer 1.0 mm	1 piece
38-684-17-07	MI Md6, spacer 1.5 mm	1 piece
38-684-18-07	MI Md7, spacer 2.0 mm	1 piece
38-684-19-07	MI Md8, spacer 2.5 mm	1 piece
38-684-20-07	MI Md9, spacer 3.0 mm	1 piece
Instrument Group Ch - Chin		
38-684-21-04	MI Ch1, chin holder, 23 cm	1 piece
Instrument Group MI - Minimally Invasive		
38-684-22-07	MI MI1, raspatory, double-sided, 18.5 cm	1 piece
38-684-23-07	MI MI2, elevator, double-sided, 18.5 cm	1 piece
38-684-24-07	MI MI3, elevator, twisted, 18.5 cm	1 piece
38-684-25-07	MI MI4, elevator, v-shaped, 20 cm	1 piece
Instrument Group RT - Retractors		
38-684-27-01	MI RT1, retractor, curved, 13.5 cm	2 pieces
38-684-28-01	MI RT2, retractor, large, 16.5 cm	2 pieces
Instrument Group HK - Hooks		
38-684-30-07	MI HK1, skin hooklet, doubled, 15.5 cm	1 piece
38-684-31-07	MI HK2, hooklet, curved, blunt, 18 cm	1 piece
38-684-29-07	MI HK3, hooklet, sharp, 18 cm	2 pieces



Instrument Group OS - Osteotomes		
38-684-33-07	MI OS1, septum osteotome, 8 mm, 18.5 cm	1 piece
38-684-34-07	MI OS2, osteotome, straight, 4 mm, 19.5 cm	1 piece
38-684-35-07	MI OS3, osteotome, curved, 4 mm, 19 cm	1 piece
38-684-32-07	MI OS4, osteotome, thin, 4 mm, 17.5 cm	1 piece
38-684-37-04	MI OS5, wedge osteotome, blunt, 16 mm, 22.5 cm	1 piece
38-684-38-04	MI OS6, blade osteotome, 8 mm, 22.5 cm	1 piece
Instrument Group BI - Basic Instruments		
38-684-42-07	MI BI1, caliper, 17 cm	1 piece
38-684-43-07	MI BI2, control instrument 10 mm, 18 cm	1 piece
38-684-36-07	MI BI3, clamp, 18 cm	1 piece
23-264-19-04	Mallet, Herbert, with gap, silcon, 19 cm	1 piece
Instrument Group SEQ - Sequence Bars		
38-684-45-07	MI SEQ1, sequence bar Le Fort I, part 1	1 piece
38-684-46-07	MI SEQ2, sequence bar Le Fort I, part 2	1 piece
38-684-47-07	MI SEQ3, sequence bar Le Fort I, part 3	1 piece
38-684-48-07	MI SEQ4, sequence bar Le Fort I, part 4	1 piece
38-684-49-07	MI SEQ5, sequence bar Le Fort I, part 5	1 piece
38-684-50-07	MI SEQ6, sequence bar Le Fort I, part 6	1 piece
38-684-51-07	MI SEQ7, sequence bar SSO, part 1	1 piece
38-684-52-07	MI SEQ8, sequence bar SSO, part 2	1 piece
38-684-53-07	MI SEQ9, sequence bar SSO, part 3	1 piece
38-684-54-07	MI SEQ10, sequence bar SSO, part 4	1 piece
38-684-55-07	MI SEQ11, sequence bar Chin, part 1	1 piece
38-684-56-07	MI SEQ12, sequence bar Chin, part 2	1 piece
38-684-57-07	MI SEQ13, sequence bar Chin, part 3	1 piece
Optional Instruments		
38-684-39-07	MI Luniatschek, double-sided, 18 cm	1 piece
38-684-40-01	MI cheek retractor, 17 cm	2 pieces
38-684-41-07	MI cutting pliers, 15.5 cm	1 piece
22-500-11-07	TC-Wire twisting forceps, 15.5 cm	2 pieces
Storage Container		
55-990-65-04	MI storage container 1, complete	1 piece
55-990-72-04	MI storage container 2, complete	1 piece

Standard Implants L1® MI Orthognathics

MI Le Fort I Osteotomy

1/1



25-551-02-09 Ti 5

25-551-02-91 Ti 1

25-551-02-71 Ti 1

⌀ = 1.0 mm



25-302-09-09 Ti 5

⌀ = 0.6 mm



25-302-11-09 Ti 5

⌀ = 0.6 mm

50-362-02-09 Ti 5

50-362-02-91 Ti 1

50-362-02-71 Ti 1

⌀ = 0.6 mm

1/1



25-569-04-09 Ti 5

25-569-04-91 Ti 1

25-569-04-71 Ti 1

⌀ = 1.0 mm



25-571-04-09 Ti 5

25-571-04-91 Ti 1

25-571-04-71 Ti 1

⌀ = 1.0 mm



25-565-04-09 Ti 5

25-565-04-91 Ti 1

25-565-04-71 Ti 1

⌀ = 1.0 mm



25-567-04-09 Ti 5

25-567-04-91 Ti 1

25-567-04-71 Ti 1

⌀ = 1.0 mm

50-375-04-09 Ti 5

50-375-04-91 Ti 1

50-375-04-71 Ti 1

⌀ = 0.6 mm

50-377-04-09 Ti 5

50-377-04-91 Ti 1

50-377-04-71 Ti 1

⌀ = 0.6 mm

50-379-04-09 Ti 5

50-379-04-91 Ti 1

50-379-04-71 Ti 1

⌀ = 0.6 mm

50-381-04-09 Ti 5

50-381-04-91 Ti 1

50-381-04-71 Ti 1

⌀ = 0.6 mm



Explanation of icons

-  Titanium
-  Units per package
-  Plate profile

STERILE | R Sterile packaged implants

MI Sagittal Split Osteotomy

$\frac{1}{4}$ 

25-396-29-09  

25-396-29-71  

 = 1.0 mm



25-401-36-09  

 = 1.0 mm



25-401-39-09  

 = 1.0 mm



Note:
All MI standard implants can be used with 2.0 mm maxDrive® screws

MI Chin Osteotomy

$\frac{1}{4}$ 

50-304-02-09  

50-304-02-71  

2 mm

 = 0.8 mm



50-304-03-09  

50-304-03-71  

3 mm

 = 0.8 mm



50-304-04-09  

50-304-04-71  

4 mm

 = 0.8 mm

Further implants and screws can be found in the Level One 1.5 Micro and 2.0 Mini system

The IPS® Product Family



IPS CaseDesigner®

The IPS CaseDesigner® makes 3D virtual surgical planning easier and faster than ever before. With this brand-new, flexible software tool, planning and simulating surgical interventions become efficient and reliable. Individualized treatment concepts can be easily transferred through a virtual approach towards patients in the operating theater.

While the IPS CaseDesigner® software is covering multiple sub-specialties of maxillofacial surgery, the first commercially available module is focusing on orthognathic surgery. It offers an intuitive and straightforward approach to virtual orthognathic planning by guiding the user through a step-by-step workflow.

Recommended computer specifications

- Broadband internet connection
- Windows 10, 64 bit or Mac OS X Yosemite or higher
- Good graphics card (NVIDIA, AMD)
- HD screen resolution
- Min. 8 GB RAM



**Prof. Dr. Dr.
Gwen R.J. Swennen,
Bruges, Belgium**

“After 20 years of personal experience with 3D virtual planning, I think that with IPS CaseDesigner® the next level of 3D virtual CMF planning software has been reached. As a part of its development I am sure it will further improve patient care in the future.”



3D Virtual Treatment Planning of Orthognathic Surgery. A Step-by-Step Approach for Orthodontists and Surgeons. Springer.



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.



IPS Implants®

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.



KLS Martin Group

KLS Martin Australia Pty Ltd.

Sydney · Australia
Tel. +61 2 9439 5316
australia@klsmartin.com

KLS Martin do Brasil Ltda.

São Paulo · Brazil
Tel. +55 11 3554 2299
brazil@klsmartin.com

KLS Martin Medical (Shanghai) International Trading Co. Ltd.

Shanghai · China
Tel. +86 21 5820 6251
china@klsmartin.com

KLS Martin India Pvt Ltd.

Chennai · India
Tel. +91 44 66 442 300
india@klsmartin.com

Martin Italia S.r.l.

Milan · Italy
Tel. +39 039 605 67 31
italia@klsmartin.com

Nippon Martin K.K.

Tokyo · Japan
Tel. +81 3 3814 1431
nippon@klsmartin.com

KLS Martin SE Asia Sdn. Bhd.

Penang · Malaysia
Tel. +604 505 7838
malaysia@klsmartin.com

KLS Martin de México S.A. de C.V.

Mexico City · Mexico
mexico@klsmartin.com

Martin Nederland/Marned B.V.

Huizen · The Netherlands
Tel. +31 35 523 45 38
nederland@klsmartin.com

Gebrüder Martin GmbH & Co. KG

Moscow · Russia
Tel. +7 499 792-76-19
russia@klsmartin.com

KLS Martin Taiwan Ltd.

Taipei 106 · Taiwan
Tel. +886 2 2325 3169
taiwan@klsmartin.com

Gebrüder Martin GmbH & Co. KG

Dubai · United Arab Emirates
Tel. +971 4 454 16 55
middleeast@klsmartin.com

KLS Martin UK Ltd.

London · United Kingdom
Tel. +44 1189 000 570
uk@klsmartin.com

KLS Martin LP

Jacksonville · Florida, USA
Tel. +1 904 641 77 46
usa@klsmartin.com

Gebrüder Martin GmbH and Co. KG

A company of the KLS Martin Group

KLS Martin Platz 1 · 78532 Tuttlingen · Germany
P.O. Box 60 · 78501 Tuttlingen · Germany
Tel. +49 7461 706-0 · Fax +49 7461 706-193
info@klsmartin.com · www.klsmartin.com

