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Spherical Ulnar Head Prosthesis (UHP)

Management of failed Sauvé-Kapandji Procedures

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In the field of hand surgery we not only offer you solutions for standard restorations, but also products for unusual and difficult situations. We therefore regard ourselves as being a true highly specialized partner in all matters relating to hand surgery with our intelligent system solutions.

Spherical Ulnar Head Prosthesis – the safe solution for failed Sauvé-Kapandji procedures

Arthrotic changes of the distal radioulnar joint (DRUJ) are frequently treated with the Sauvé-Kapandji procedure. However, this can occasionally lead to instability of the ulnar stump, causing in turn a painful radioulnar impingement (ulnar stump impinging on radius).

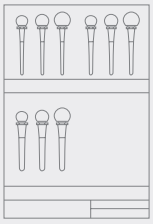
The conventional management of this condition – stabilizing the ulnar stump by tenodesis, using a tendon strip of the flexor carpi radialis, for example – provides only short-term relief, especially in heavy manual workers, as the tenodesis wears out with time and the impingement recurs. And since these patients typically have already undergone several reconstructive operations on the DRUJ, soft tissue stabilization is no longer an option.

With the surgical procedure described here, it is possible to restore ulnar continuity by implanting an ulnar head prosthesis into the remaining ulnar stump below the existing distal arthrodesis. The prosthesis features a spherical head that articulates with a socket newly created for this purpose in the proximal area of the fused ulnar head.

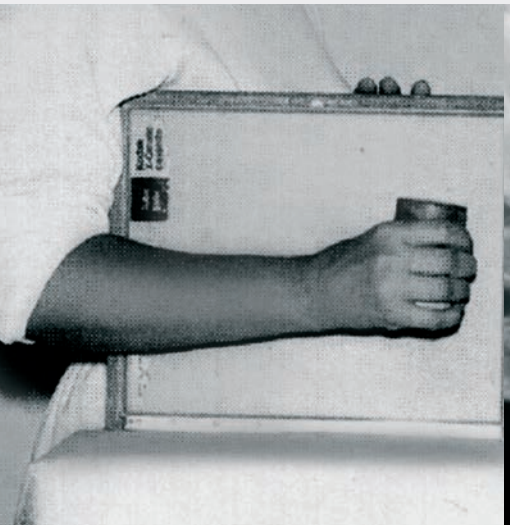
Feature, Function and Benefit

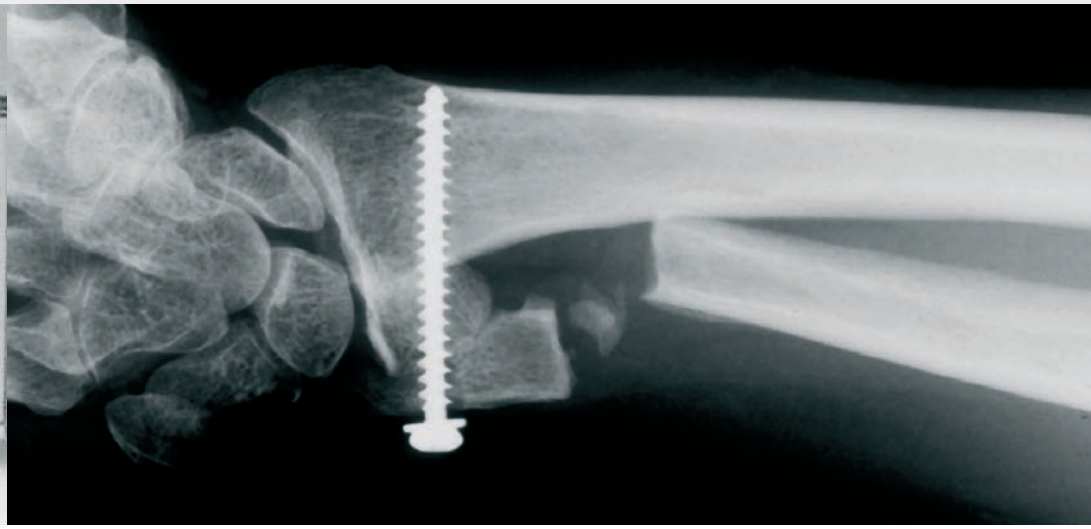
Drawing on extensive experience with the Ulnar Head Prosthesis, which has established itself in recent years as a therapeutic option for disorders of the distal radioulnar joint along with conventional surgical procedures, we decided to upgrade the system by including a spherical ulnar head prosthesis specially designed for revising failed Sauvé-Kapandji procedures.

This operating technique allows the surgeon to retain and utilize the original arthrodesis of the radioulnar joint for increased stability of the newly created joint. The special instruments needed for reaming the required joint socket have been adapted for easy use under the restricted spatial conditions dominating this joint area.

	Feature	Benefit
Design 	■ 3 different types of stem, each available in three sizes ■ 3 different head sizes ■ Uniform conical press fit as connection between the stem and the head of the prosthesis ■ Revision prosthesis with lengthened neck	■ Intraoperative flexibility ■ Freely interchangeable prosthetic stems and heads ■ System can be used also in cases of a severely shortened ulna
Surgical technique 	■ Existing arthrodesis of the radioulnar joint is left intact ■ X-ray templates ■ Trial heads and stems	■ Increased stability ■ Easy preoperative planning ■ Error-proof selection of the correctly sized prosthesis
Material 	■ Ceramic prosthetic head ■ Stem made of titanium alloy with coating of pure titanium	■ Excellent biocompatibility and biomechanical conditions ■ No cement required for anchoring the stem of the prosthesis in the ulna ■ Promotes osteointegration
Instrumentation 	■ Spherical burrs with flexible shaft ■ Head gauges	■ Easy handling in tight quarters ■ Exact measuring of the artificial joint cavity

Step by step to optimal fixation





Fields of Use

The spherical UHP ulnar head prosthesis is used as follows:
As revision in the case of painful instability due to unsatisfactory results after Sauvé-Kapandji procedure.

Preoperative planning

The extent of ulnar and/or carpal instability and the soft tissue condition should be assessed by careful clinical examination. Accurate length planning (using X-ray templates and taking 90°/90° X-rays of both forearms) is of par-ticular importance for allowing the surgeon to determine the optimal resection level and the size of the required spherical head and stem.

Preoperative X-rays taken under load are also essential to determine the extent of the radioulnar impingement. For the horizontal posteroanterior X-ray, the patient holds a 500-g weight in his hand.

Positioning

To perform the procedure, the exsanguinated arm is placed on an operating table in full pronation. Intraoperative X-ray control using an image converter is recommended.

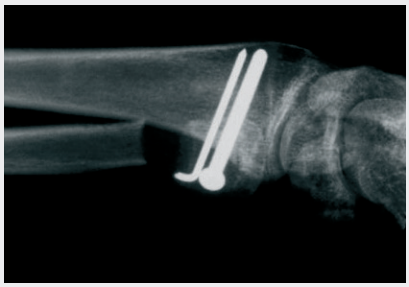


Fig. 1:
Radioulnar impingement syndrome with severe instability of the proximal ulnar stump after Sauvé-Kapandji procedure and several previous surgical operations on the distal radio-ulnar joint.

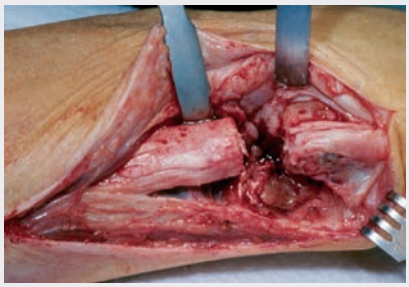


Fig. 2:
Surgical exposure through the old scar, which is usually slightly extended in proximal direction. Care should be exercised to identify and preserve the dorsal sensory branch of the ulnar nerve during this step. This is followed by exposure of the fused ulnar head and the proximal ulnar stump between the extensor carpi ulnaris and extensor digiti quinti muscles. Longitudinal opening of a relatively dense scar plate between these two structures is required as well.

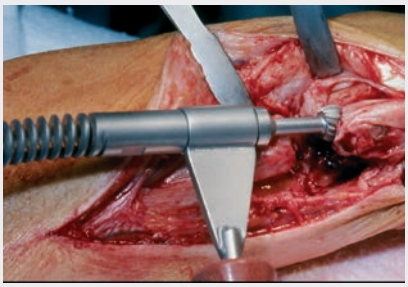


Fig. 3:
Spherical burrs are now used to hollow out the proximal surface of the fused ulnar head to create the new socket.

Flexible shaft

Spherical burr

Surgical documentation: Prof. Dr. Diego L. Fernandez, MD

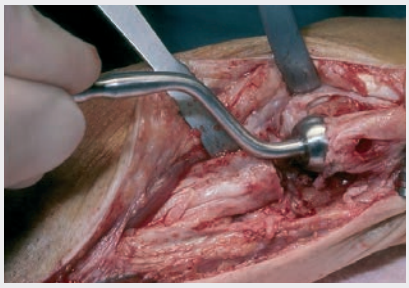


Fig. 4:
The depth and shape of the new socket is checked with the appropriate ball head gauge under X-ray control.

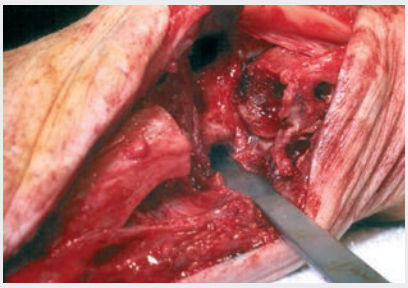


Fig. 5:
The spherical socket should embrace two-thirds of the prosthetic head. However, the cavity should be kept as shallow as possible to prevent fracture of the arthrodesis.

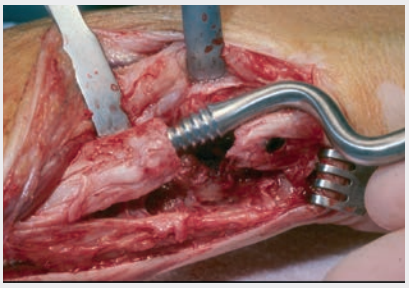


Fig. 6:
The medullary canal is opened with the pointed awl at the end of the ulnar stump, then the small reamer is hammered in as far as it will go. Depending on the planned size of the prosthesis, the larger reamer of appropriate size is subsequently inserted.

Head gauge

Awl Reamer

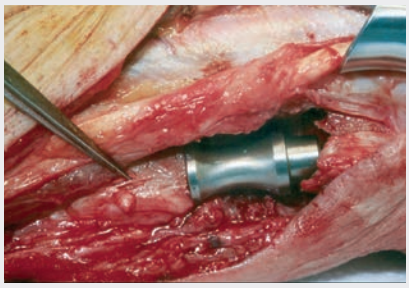


Fig. 7:
The trial prosthesis is inserted. Its conical end should be located slightly proximal to the fused ulnar head.

Fig. 8:
To prevent fractures in the thin bone edge of the ulnar head, we recommend performing an oblique, partial osteotomy on the radius for indirect reduction of the new socket relative to the spherical head.

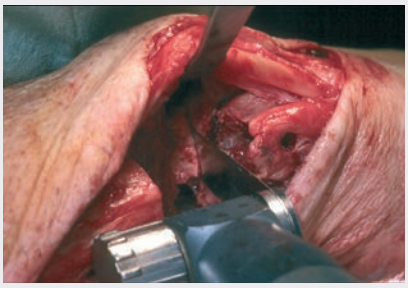


Fig. 9:
The radial osteotomy is carried out proximally to the arthrodesis.

Trial prosthesis

Surgical documentation: Prof. Dr. Diego L. Fernandez, MD

Fig. 10:
After widening the bone gap, the depth and form of the new socket are checked with the appropriate head gauge under X-ray control. If the trial prosthesis has been inserted, the trial head can also be used for this purpose.

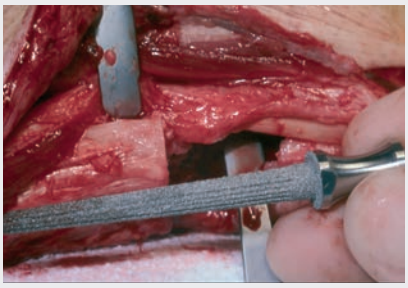


Fig. 11:
The definitive stem of the prosthesis is inserted with the conical impactor.

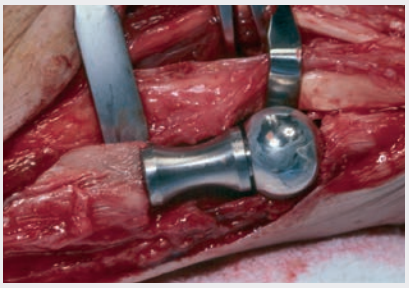


Fig. 12:
The head of the prosthesis is placed on the conical end of the stem and fixed in place with a light stroke of the hammer.

Head gauge

Conical impactor

Prosthetic stem

Spherical head

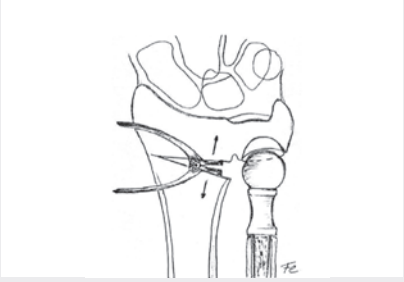


Fig. 13:
When putting the head in place, make sure to keep the radial bone gap open in order to prevent fissures in the thin, hollowed ulnar head.

Fig. 14:
Upon closing the bone gap on the radius, the prosthetic head should perfectly articulate with the spherical socket (given correct preoperative length planning). A space of 1-2 mm will form postoperatively between the prosthetic head and the joint socket.

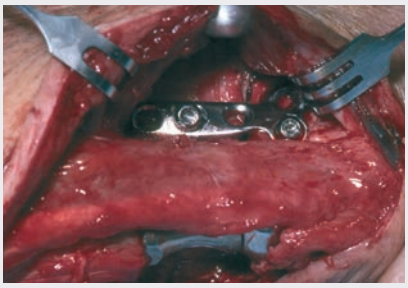


Fig. 15:
The closed osteotomy gap is fixed with a dorsoulnar small-fragment plate. The local scar tissue can be used as a flap to cover the neck and head of the prosthesis with a tight cuff. Part of this flap is anchored transosseously to the fused ulnar head. The tendon sheath of the extensor carpi ulnaris muscle is fixed in place laterally to the tendon sheath of the extensor digiti quinti muscle. This causes a certain dorsal shift of the extensor carpi ulnaris, thus providing additional prosthesis coverage.

Surgical documentation: Prof. Dr. Diego L. Fernandez, MD

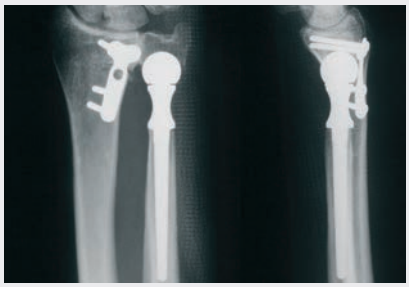


Fig. 16:
Postoperative result

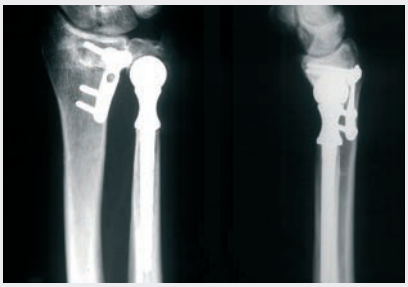


Fig. 17:
Result after one year

Follow-up treatment:
An ulnar Scotch Cast® U plaster splint is worn until the wound has healed. Thereafter, a removable wrist splint is worn for another three weeks after suture removal.

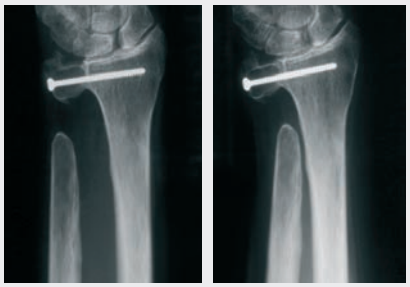


Fig. 1:
Radioulnar impingement following a Sauvé-Kapandji procedure: the X-rays reveal radioulnar convergence under load.

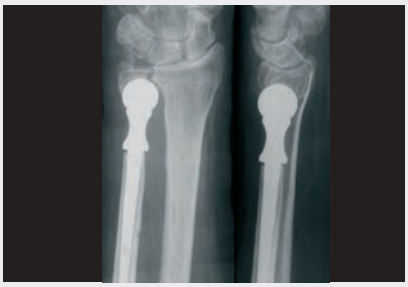


Fig. 2:
Postoperative result four months after revision using a spherical ulnar head prosthesis.

Fig. 3:
Postoperative result after 1.8 years. The artificial spherical cavity forms a perfect socket for the spherical head. Note the 1.2-mm joint space.

Fig. 4:
Pronation has been completely restored, and supination nearly so.

Fig. 5:
Late follow-up 2.6 years after the operation shows spherical, concentric bone sclerosis around the prosthetic head.

Stems and spherical heads

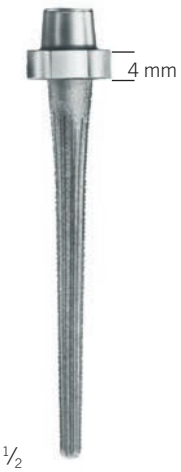
Standard collar

26-210-01-09

STERILE

Item No.	Implants
26-210-01-09	small
26-210-03-09	mittel
26-210-05-09	groß

Standard collar +

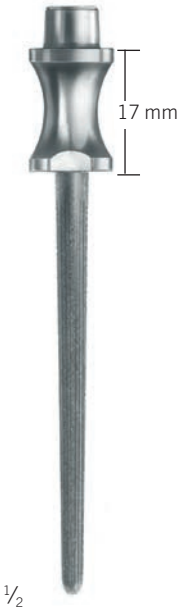


26-210-11-09

STERILE

Item No.	Implants
26-210-11-09	small
26-210-13-09	mittel
26-210-15-09	groß

Revision collar



26-210-21-09

STERILE

Item No.	Implantate
26-210-21-09	small
26-210-23-09	mittel
26-210-25-09	groß

Icon explanations

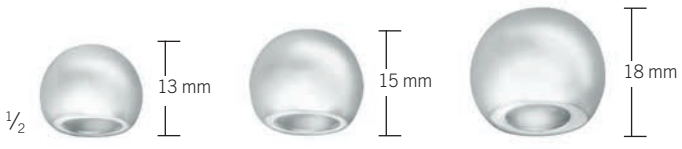
Ti Titanium

Ce Ceramics

1 unit(s) Items/pack

STERILE Sterile packed implants

Spherical ceramic heads



26-220-09-04 26-220-11-04 26-220-13-04

STERILE

Item No.	Implants
26-220-09-04	small
26-220-11-04	mittel
26-220-13-04	groß

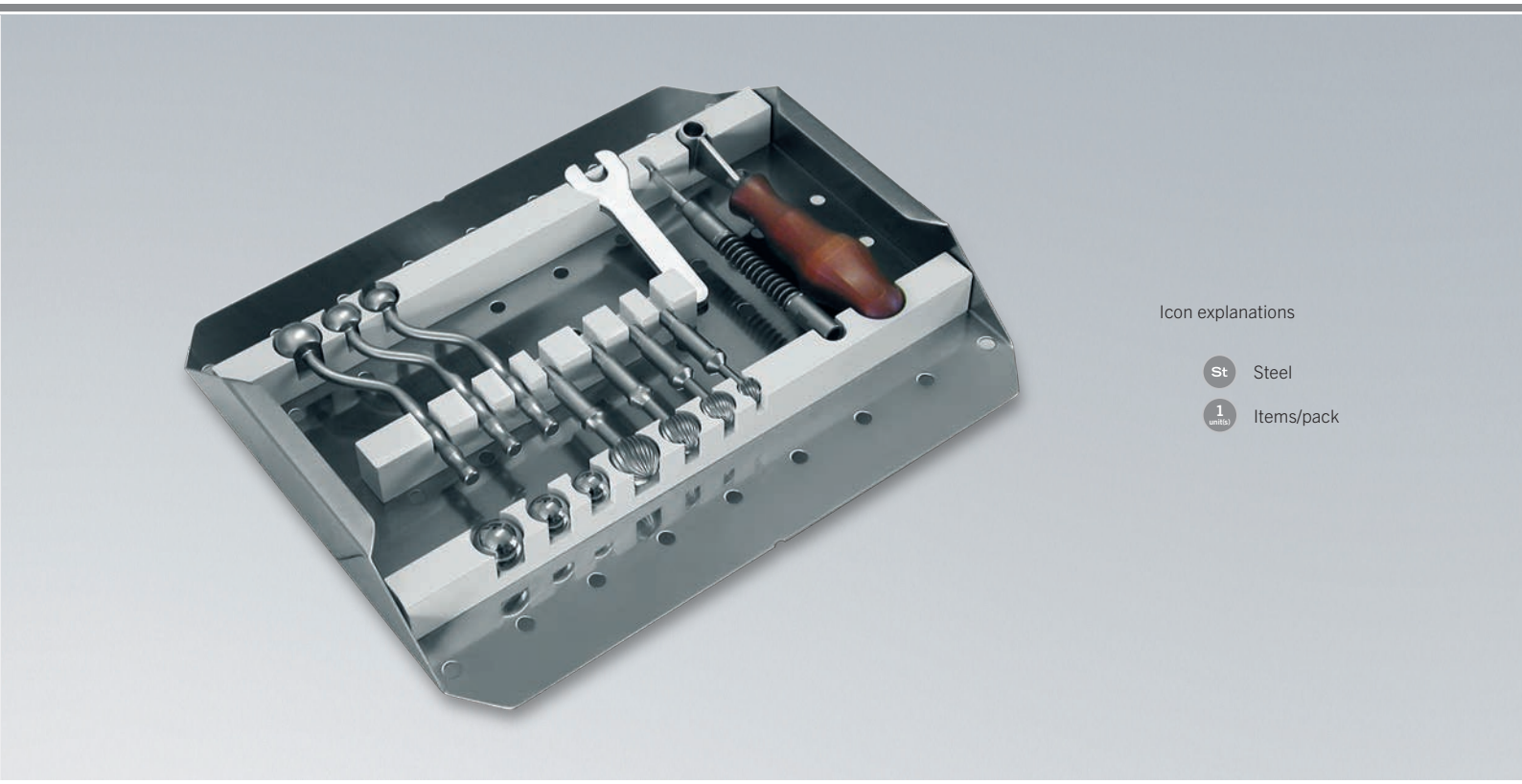
Storage module for instruments

Spherical Ulnar Head Prosthesis Set, complete

26-230-00-04

consisting of:

Item No.		Instruments: Trial heads, spherical
26-231-09-05	1	small
26-231-11-05	1	mittel
26-231-13-05	1	groß
		Kopflehres, spherical
26-241-19-07	1	small
26-241-21-07	1	mittel
26-241-23-07	1	groß
		Instrumente
26-241-01-07	1	Handle
26-241-03-07	1	Flexible shaft
26-241-99-07	1	Schlüssel
		Kugelfräsen
26-241-09-07	1	mini
26-241-13-07	1	small
26-241-15-07	1	mittel
26-241-18-07	1	groß
		Storage module
55-910-20-04	1	



Icon explanations

St Steel

1 unit(s) Items/pack

Trial heads, spherical

"DNI" = Do not implant

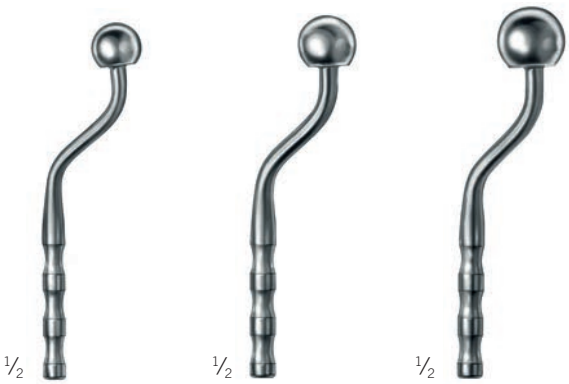
½

26-231-09-05 26-231-11-05 26-231-13-05

Item No.	Trial Implants	
26-231-09-05	small	St 1
26-231-11-05	mittel	St 1
26-231-13-05	groß	St 1

Head gauges, spherical burrs and instruments

Head gauges, spherical



26-241-19-07 26-241-21-07 26-241-23-07

Item No.	Instruments
26-241-19-07	small
26-241-21-07	mittel
26-241-23-07	groß

Spherical burrs

26-241-13-07

Item No.	Instruments	Reaming Depth
26-241-09-07	mini	9 mm
26-241-13-07	small	13 mm
26-241-15-07	mittel	15 mm
26-241-18-07	groß	18 mm

Icon explanations

St Steel

1 unit(s) Items/pack

Fz Ferrozell

Instruments

1/2

26-241-01-07
Handle

St 1 Fz

1/2

26-241-03-07
Flexible shaft

St 1

1/2

26-241-99-07
Wrench

St 1

Notice

The instruments for the spherical Ulnar Head Prosthesis are intended as a supplement to the set of instruments for the standard Ulnar Head Prosthesis and can only be used in conjunction with the standard set.

Service and information material

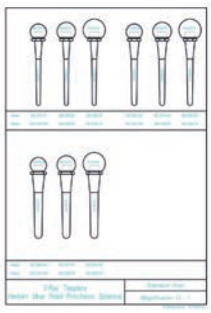
Reference

Fernandez DL, Joneschild ES, Abella DM
“Treatment of Failed Sauvé-Kapandji Procedures with a Spherical Ulnar Head Prosthesis”,
Clinical Orthopaedics and Related Research, 445, 100–107

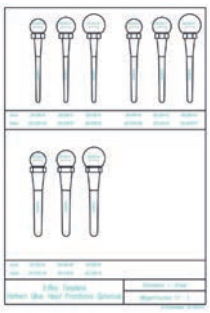
Fok MWM, Fernandez DL, van Schoonhoven J
„Midterm Outcomes of the Use of a Spherical Ulnar Head Prosthesis for Failed Sauvé-Kapandji Procedures“
J Hand Surg Am. 2019;44(1):66.e1-e9

Preoperative planning

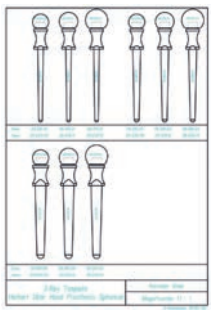
X-ray templates for preoperative planning are available from Gebrüder Martin.
Please call +49-7461-706-109.



Standard
90-195-52-21



Standard plus
90-196-52-21



Revision
90-197-52-21

Ulnar Head Prosthesis
product brochure
Printed version
90-665-16-10

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for hand fracture treatment

HBS 2
for the treatment of fractures and non-unions in small bones

Ixos®
for the treatment of distal radius fractures

IPS Implants®
for patient-specific radius reconstruction

IPS Implants®
for patient-specific forearm reconstruction

CapFlex PIP
for endoprosthetic treatment of the PIP joints

Genos
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Flower Plate
for mediocarpal partial arthrodesis

UHP
for treating disorders of the distal radioulnar joint

Recos®
for ulnar shortening and radius reconstruction osteotomies

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