

# CASE STUDY



## Corrective osteotomy in a complex malunited intraarticular radius fracture with the Medartis CMX planning tool

### The Surgeon

Dr. Jörg Hainich is an FMH specialist in orthopedic surgery and traumatology of the musculoskeletal system with a focus on hand surgery with over ten years of experience in complex wrist injuries. He works at the Cantonal Hospital St. Gallen, Department of Hand, Plastic and Reconstruction Surgery.

### Introduction

Malunited radius fractures are still challenging in terms of proper corrective osteotomy and reduction, especially if there are more than two intraarticular fragments to address. 3D preoperative planning together with drill, saw and reduction guides gives access to reconstruction of complex fractures that were largely inaccessible in the past.

### The Case



#### Patient Profile

54 year old female reported a fall on her left hand two and a half months ago. She was admitted to hospital and underwent open reduction and internal fixation of a distal, displaced, intraarticular radius fracture 4 days later in an elective setting. 6 week follow-up X-ray showed a secondary dislocation with an intraarticular step-off of 2.5 mm and comminution of the dorsal aspect of the radius. On the occasion of the first appointment in our outpatient clinic she still reported pain and severe limitation of movement when trying to flex or extend the wrist. Supination and pronation was also drastically reduced.

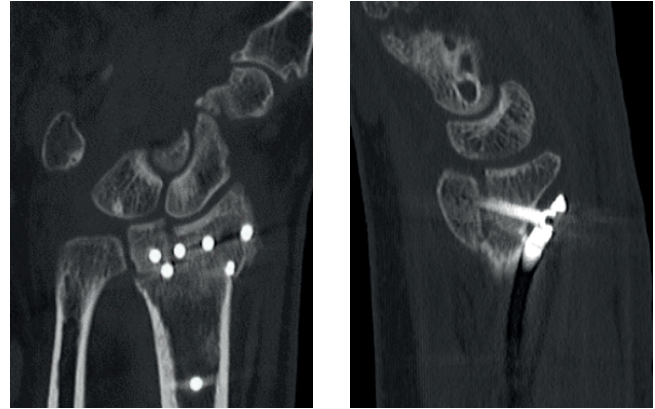




### Preoperative Analysis Wrist

A CT scan of both wrists and forearms was carried out and a 3D analysis by the Medartis CMX Team was done. It emerged that 3 consecutive osteotomies would be required, 2 of them intraarticular.

A step-by-step procedure was drafted with the required patient-specific saw and drill guides.

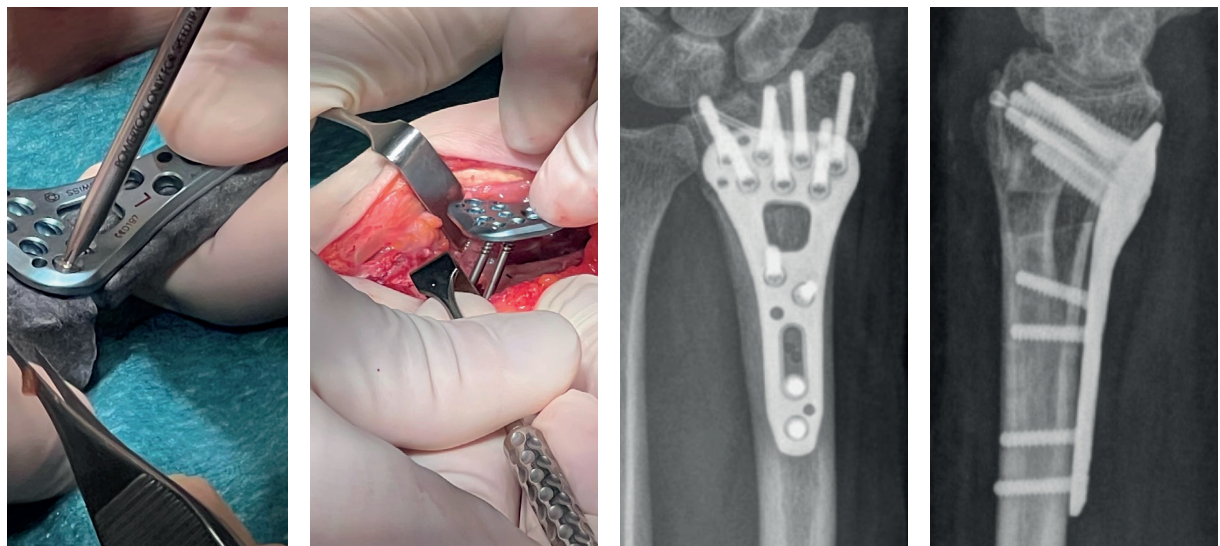
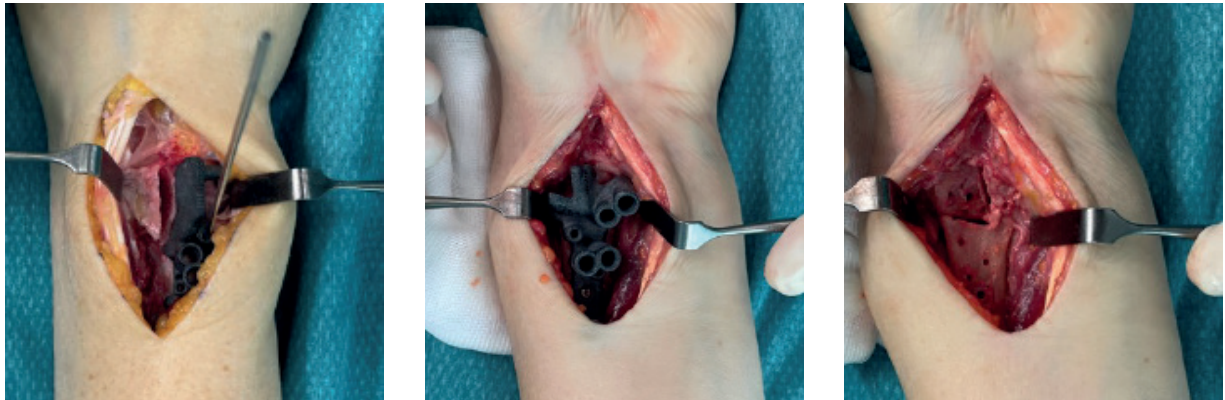


### Surgical Treatment

Procedure started with a palmar approach and metal removal followed by a dorsal approach and dividing the 4th extensor compartment.

After fixing the first guide, the dorsal ulnar fragment was separated by osteotomy. The second guide was placed on the palmar side and two more cuts and drilling were performed. By using the bone model, two locking pegs were fixed in a predefined angle through the chosen correction plate.

This construction was afterwards used to bring the now loose fragments into in the desired position and to secure the reduction.





### Intraoperative Findings

The most difficult part in addressing consolidated intraarticular fractures is not injuring opposite joint surfaces. With the provided patient-specific saw guides with preoperatively defined saw angles the cutting depth risk of collateral damage is minimized.



### Postoperative Treatment

A removable splint was applied and the patient was allowed non weight bearing exercises immediately after surgery. 6 weeks after, she reported no pain and full range of motion in pronation and supination. Extension and flexion of the wrist was still limited and required further therapy.



### Conclusion

3D preoperative planning is going to become a key element of reconstruction of malunited intraarticular distal radius fractures. It not only offers a fast operative procedure and a predictable radiological outcome, it also lets the surgeon treat malalignments that were hard to address in the past.

The CMX service including preoperative planning and patient-specific drill and saw guides offers a solution to adequately treat even complex, intraarticular malunions of the distal radius.