CONFLICT OF INTEREST

ARGOMEDICAL™ (Switzerland)

Inventor
Philippe Liverneaux
DISTAL RADIUS FRACTURE IN ELDERLY

MALIGNANT TUMOR

MAL-UNION

TWA REVISION

TWA

Isoelastic prosthesis (Butel 1988)
Distal Radius Isoelastic Resurfacing Prosthesis: A Preliminary Report

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Frédéric Bodin, MD, PhD4  Philippe Liverneaux, MD, PhD1

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2 Department of Orthopedic Surgery, Juntendo University, Tokyo, Japan
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Objectives
- joint surface
- patient autonomy

Difficulties
- OSTEOPOROSIS
- COMMINUTION
Means
Locking systems
Joint replacement
INTRODUCTION

DISTAL RADIUS FRACTURE IN ELDERLY

TWR

Herzberg 2011
acute fracture ⊗
Carpal component

Resurfacing prosthesis
Roux 2011, Herzberg Adams, Wolfe
Huge resection
Primary stability limited
Specification for trauma prosthesis

Uni
- No carpal component
- Subchondral bone only
- Preserve bone stock

Primary stability
- Intramedullary
- Radial head

Isoelastic prosthesis
(Butel 1988)
2011-2017 = 3197 DRF
42 Prosthelast = 1.3%

- 24 follow-up > 2y
- Age 78 (60-91)
- 22 ♂ 2 ♀
METHODS

DISTAL RADIUS FRACTURE IN ELDERLY
RESULTS

DISTAL RADIUS FRACTURE IN ELDERLY

Follow up
55.2Y (24M-97M)

Pain
2.1/10 (0-7)

Q DASH
39.8/100 (9.09-77)

PRWE
42.7/100 (5-95)

Strength (% contralateral)
65.5 (25-150)

Motion (% contralateral)
- Flexion 55
- Extension 73
- Pronation 97
- Supination 88
RESULTS

DISTAL RADIUS
FRACTURE
IN ELDERLY

X-ray
UV = +0.17 mm
Loosening = 0
Remodeling = 22
Migration = 8
Arthrosis = 0
Conflict carpus = 3

Isoelasticity?
Tourniquet duration

- Mean 62 min
- Min 37 min
- Max 126 min

Complications

- 6 CRPS (healed)
- 5 revisions
  - 2 PRC
  - 1 Darrach
  - 1 RC fusion
  - 1 new prosthelast
## RESULTS

**DISTAL RADIUS FRACTURE IN ELDERLY**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Surgeon level</th>
<th>Tourniquet time (min)</th>
<th>Active motion (%)</th>
<th>Pain (0-10)</th>
<th>Quick DASH (0-100)</th>
<th>PRWE (0-100)</th>
<th>GRIP Strength %</th>
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Average:

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<th>Quick DASH (0-100)</th>
<th>PRWE (0-100)</th>
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## DISCUSSION

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<th>Series</th>
<th>Prosthesis</th>
<th>Patient (n)</th>
<th>Age (min)</th>
<th>Time (min)</th>
<th>Complications (Cal/CRPS)</th>
<th>Follow-up (months)</th>
<th>Range of motion (°)</th>
<th>Pain (0-10)</th>
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### DISTAL RADIUS FRACTURE IN ELDERLY
DISTAL RADIUS FRACTURE IN ELDERLY

MALIGNANT TUMOR

MAL-UNION

TWA REVISION

TWA
Technical note

Unicompartmental isoelastic resurfacing prosthesis for malignant tumor of the distal radius: A case report with a 3-year follow-up

S. Ichihara\textsuperscript{a,b}, J.J. Hidalgo-Diaz\textsuperscript{a}, S. Facca\textsuperscript{a}, P. Liverneaux\textsuperscript{a,*}

\textsuperscript{a} Icube CNRS 7357, hand surgery department, Strasbourg university hospitals, FMTS, university of Strasbourg, 10, avenue Baumann, 67400 Illkirch, France
\textsuperscript{b} Department of orthopedic surgery, Juntendo university, Tokyo, Japan

\begin{abstract}
We report a case of 74-year-old man in whom a unicompartmental isoelastic resurfacing prosthesis was used to reconstruct the distal radius after en-bloc resection of a malignant tumor. Thirty-nine months after the operation, on a visual analogic scale, pain score was 0/10 and range of motion was 25° of flexion, 5° of extension, 70° of pronation, 45° of supination, 20° of radial deviation, and 30° of ulnar deviation. The Quick DASH functional score was 72.72/100. With radiographic finding, the prosthesis was well-aligned, with no evidence of looseness but with slightly implant conflict with the lunate. This case report indicates that unicompartmental isoelastic resurfacing prosthesis seems a simple and reliable technique for distal radius reconstruction after en-bloc resection of malignant tumor.
\end{abstract}

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PRE-op

73 yo, right handed
- Kidney cancer
- Lung metastasis
- R distal radius metastasis

Oncologist proposal
- Amputation or/
- Reconstruction
  - No bone graft (Radiotherapy)
  - ASAP (risk of fracture)
  - No time to wait for a custom-made prosthesis
PER-op

Resection 12cm
Reconstruction PMMA
POST-op

Radiotherapy
14 M FOLLOW-up

No recurrence
QDASH 13.64
PRWE 29
Pain 1/10
Grip 14/30kg
PROSTHELAST© ARGOMEDICAL™

Isoelastic prosthesis (Butel 1988)

DISTAL RADIUS FRACTURE IN ELDERLY

MALIGNANT TUMOR

MAL-UNION

TWA REVISION

TWA
A CASE OF BILATERAL MAL-UNION

© ARGOMEDICAL™

57 yo, right handed
A CASE OF BILATERAL MAL-UNION
PROSTHELAST© ARGOMEDICAL™

Isoelastic prosthesis (Butel 1988)

DISTAL RADIUS FRACTURE IN ELDERLY

MALIGNANT TUMOR

MAL-UNION

TWA REVISION

TWA
A CASE OF TWA REVISION

48y.o
RA
TWA 2009
A CASE OF TWA REVISION
A CASE OF TWA REVISION

PROSTHELAST© ARGOMEDICAL™

2009

2013. 3

2013. 7
Joint surface
  PE
Bone remodelling
  isolasticity
Stability
  Horizontal
Ostéointegration
  HA & Ti
A CASE OF PROSTHETIC TWA REVISION
PROSTHELAST© ARGOMEDICAL™

A CASE OF TWA REVISION
A CASE OF PROSTHELAST© TWA REVISION

3 MONTHS POST-OP
A CASE OF TWA REVISION

2 YEARS POST-OP
DISTAL RADIUS FRACTURE IN ELDERLY

MALIGNANT TUMOR

MAL-UNION

TWA REVISION

TWA
Surgical technique: about a new total and isoelastic wrist implant (Prosthelast®)

Santiago Salazar Botero¹ · Yuka Igeta¹,² · Sybille Facca¹ · Chiara Pizza¹ · Juan José Hidalgo Diaz¹ · Philippe A. Liverneaux¹

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Abstract
This study describes a new total wrist implant (Prosthelast®) designed to reduce the risk of distal migration of the carpal component. The Prosthelast® implant consists in a one-block radial implant replacing the metaphysis and the articular surface fixed to a radial elastic centromedullar wire and a carpal component in titanium with an articular condylar surface in polyethylene. We operated on five patients (three male patients and two female patients) and followed them up for 12 months on average. Two of the patients presented with rheumatoid arthritis of the wrist, and an ulnar osteotomy (Darrach procedure) was carried out at the same time of the arthroplasty. All clinical variables improved postoperatively (Quick DASH score, pain score, range of motion) except from wrist flexion which was reduced. No patients underwent revision surgery. Two patients presented with a periprosthetic radiolucent loosening around the radial component, but no implant migration was observed. Overall, the preliminary results of our case series show that the new Prosthelast® implant presents comparable short-term results to those described in the literature. We will follow up the patients to verify that long-term results are as satisfactory as the short-term results.
ESTIMATED AVERAGE SURVIVAL RATE: REMOTION® >90% (8 YEARS)

Sagerfors et al. 2015
Boeckstyns et al. 2013
Herzberg et al. 2012

ESTIMATED AVERAGE SURVIVAL RATE: REMOTION® 69% (10 YEARS)

Honecker et al. 2018
INTRODUCTION

COMPLICATIONS

(Gaspar et al, 2016)

LOOSENING AROUND THE RADIAL COMPONENT
DISTAL MIGRATION OF THE CARPAL COMPONENT
HYPOTHESIS 1

HORIZONTAL FIXATION OF THE CARPAL IMPLANT TO AVOID DISTAL MIGRATION?

Biomechanical comparison of three fixation techniques used for four-corner arthrodesis

J. Krasanis, D. S. Dennis, L. J. Berglund, K. N. An and A. Y. Skin

Abstract

Clinical results following four-corner arthrodesis vary and suggest that nonunion may be related to certain fixation techniques. The purpose of our study was to examine the displacement between the bone and implant, and compare the fixation techniques in this regard. We conducted a prospective trial comparing three fixation techniques for four-corner arthrodesis: (1) the plate and screw technique, (2) the inlay with a cortical bone block, and (3) the inlay with a cortical, circular plate. A total of 10 patients with osteoarthritis and 10 patients with osteoarthritis and ulnar variance were included in each group. The results were compared to the biomechanical behavior of the fixation techniques within a cadaver model.
HYPOTHESIS 2

ISOELASTICITY OF THE RADIAL COMPONENT TO AVOID LOOSENING?
### 5 PATIENTS / TWA PROSTHELAST®

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<th>Age</th>
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RESULTS

5 PATIENTS / TWA PROSTHELAST®

PREOP

POSTOP

Patient 2
Patient 2
Patient 3
Patient 4
Patient 5
RESULTS

5 PATIENTS / TWA PROSTHELAST®

PAIN

GRASP

PREOP POSTOP
RESULTS
## RESULTS

5 PATIENTS / TWA PROSTHELAST®

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<th>Follow up (months)</th>
<th>Radius loosening (Y/N)</th>
<th>Migration (Y/N)</th>
<th>Carpus loosening Central plot (Y/N)</th>
<th>loosening screw (Y/N)</th>
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The concept of a Unicompartmental isoelastic resurfacing prosthesis offers a promising option for the treatment of comminuted, osteoporotic distal radius articular fractures of elderly patients.