



**UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO**

*Dipartimento di
Scienze Mediche di Base, Neuroscienze ed
Organi di Senso*

UU.OO. ORTOPEDIA E TRAUMATOLOGIA
Direttore: Prof. B. Moretti

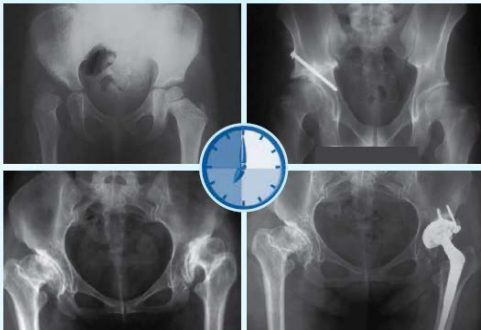


Evento Patrocinato SIOT



CONGRESSO NAZIONALE DELLA SOCIETÀ ITALIANA DELL'ANCA (S.I.d.A.)
**"LA DISPLASIA CONGENITA EVOLUTIVA
DELL'ANCA: RITORNO AL FUTURO"**

BARI, 6-7 DICEMBRE 2013
Sheraton Nicolaus Hotel & Conference Center



PRESIDENTE ONORARIO: Prof. Carmelo Simone

PRESIDENTE: Prof. Biagio Moretti

COORDINATORE SCIENTIFICO: Prof. Giuseppe Solarino

AUGMENT ACETABOLARI

*G. Solarino,
F. Ruggiero, A. Panella, C. Mori, B. Moretti*

INTRODUZIONE

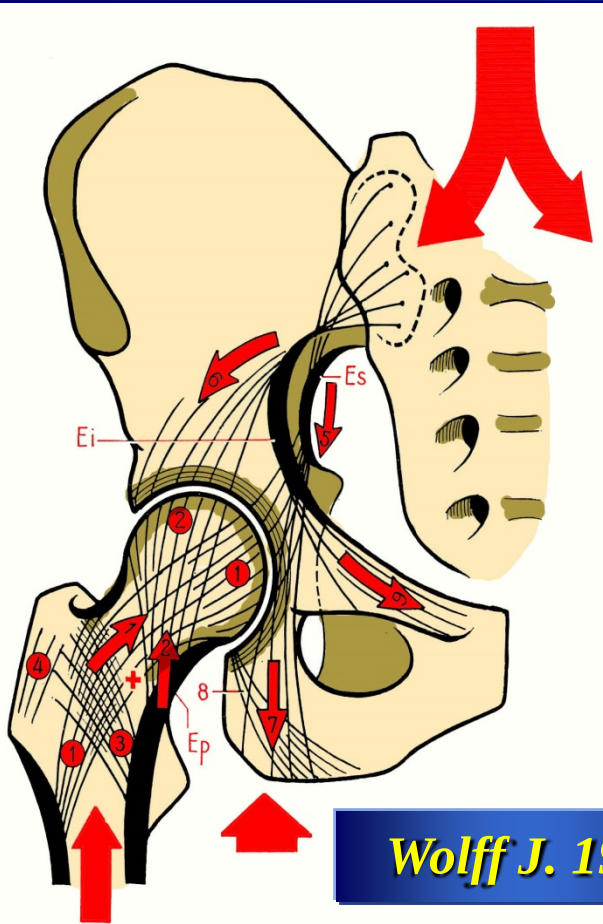
**Il fallimento di un'artroprotesi d'anca
determina l'**osteolisi periprotetica** per
reazione cellulare ai prodotti di consumo
e/o per mancata fissazione delle
componenti protesiche**

Table 1 Paprosky classification of acetabular defects

Type of defect	Radiographic and intraoperative findings
Type-I	Acetabular rim, anterior-posterior column intact Implies near primary situation with >90% host bone support of cup
Type-II	Less than 3 cm superior migration Distorted acetabular rim. Intact anterior and posterior columns Adequate stability with Trial. Greater than 50% contact surface
IIA	Superior and medial cavitation defect. Intact rim
IIB	Segmental supero-lateral defect (less than 1/3 of circumference)
IIC	Medial defect with cup medial to Kohler's line (Protrusio)
Type-III	Greater than 3 cm superior migration Non-supportive acetabular rim for biological fixation
IIIA "Up and Out"	Lateral to Kohler's line. Intact medial support Moderate ischial lysis (<15 mm below superior obturator line) Medial limb of teardrop is intact Superior and lateral migration "up and out" Contact of trial with bone over 40–60% Intact ilioischial and iliopubic
IIIB "Up and In"	Broken Kohler's line. No medial or superior supportn Extensive ischial osteolysis (>15 mm below superior obturator line) Complete destruction of tear drop Superior and medial migration "up and in" Under 40% contact surface. High risk of occult pelvic discontinuity
Pelvic discontinuity	Fracture line through columns Broken Kohler's line or obturator foramen asymmetry on AP pelvis Superior and inferior hemipelvis separation

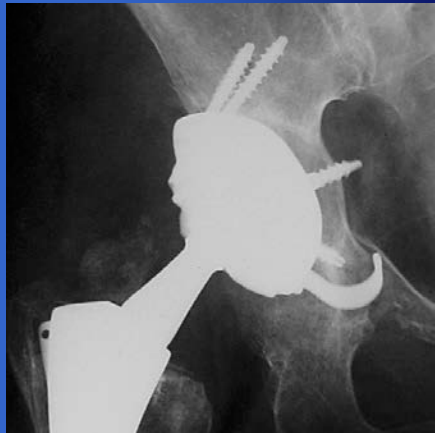
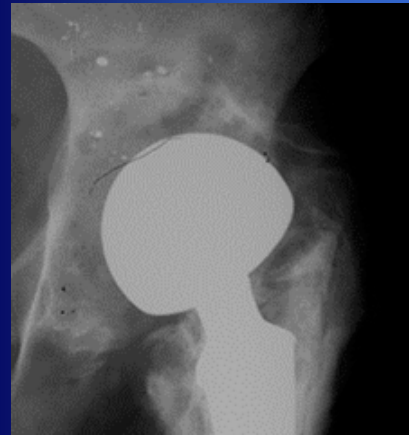
INTRODUZIONE

OBIETTIVI NELLA CHIRURGIA DI REVISIONE



Wolff J. 1986

- **Clinico:** ripristinare la funzione dell'anca
- **Biomeccanico:** ricercare il centro di rotazione dell'anca
- **Anatomico:** colmare i difetti ossei
- **Biologico:** ottenere l'osteointegrazione dei trapianti



REVISION SURGERY

Burch-Schneider antiprotrusio cage for acetabular revision: a 5- to 13-year follow-up study

Antonio Coscujuela-Mañá, Francesc Angles, Carles Tramunt, Xavier Casanova

- **Ninety-six acetabular revisions**
- **Paprosky type 2A (9 hips), type 2B (31 hips), type 2C (20 hips), type 3A (25 hips), and type 3B (11 hips)**
- **Mean follow-up of 8.1 years (range 5-13 years)**
- **There were 3 rerevisions (1 because of aseptical loosening)**
- **The Kaplan-Meier survivorship rate was 92.4%**
- **Radiographic evaluation determined that 3 cages were considered definitely loose**
- **A viable treatment option in the reconstruction of severe bone defects**

ORIGINAL ARTICLE

The Burch-Schneider antiprotrusio cage: medium follow-up results

J. Lamo-Espinosa · J. Duarte Clemente ·

P. Díaz-Rada · J. Pons-Villanueva · J. R. Valentí-Nín

- The postulated advantages of the Burch-Schneider antiprotrusio cage are: (1) protects the allograft from load, (2) recovers the anatomical center of rotation of the hip, (3) supports the cemented polyethylene device
- **Sixteen patients**, mean age was 66.1 years (range 48–78)
- According to Paprosky classification, 18.7 % were grade IIb, 56.3 % grade IIIa and 25 % grade IIIb
- The mean follow-up was 60.6 months: none of the patients needed reintervention, so **survival was 100 %** considering reintervention as event of interest. **Two** cases showed a non-progressive radiolucency of 2 mm in the area of the ischial flap and area I of De Lee, **one** case showed radiolucencies in areas I, II and III of De Lee with a change of acetabular inclination, **another** patient had a broken iliac screw not associated with changes in acetabular position, **two** cases with grade I (possible loss) and **two** cases with grade III (definitive loss) using the criteria described by Gill
- Although it is technically more demanding, the ischial flap should be inserted inside the ischial portion of the acetabulum

Acetabular Revision Surgery With the LOR Cup

Three to 8 Years' Follow-Up

Michele F. Surace, MD, Giovanni Zatti, MD,
Marco De Pietri, MD, and Paolo Cherubino, MD

- 41 acetabular revision surgeries for aseptic loosening using **42 LOR cups** (allografts were used in 19 cases, 47.5%)
- Paprosky: 4 type 2A (9.5%), 12 type 2B (28.6%), 6 type 2C (14.3%), 14 type 3A (33.3%), and 6 type 3B (14.3%)
- Regular liners were used in 27 cases (64.3%) and liners with distally shifted rotational center in 15 cases (35.7%)
- Mean follow-up was 63.5 months (range 40-99)
- **Neither rotation nor migration of the cups could be detected**
- The x-ray did not show any radiolucent line in 26 cases (65 %), whereas in 13 cases (32.5%) a nonprogressive line thinner than 1 mm was noted

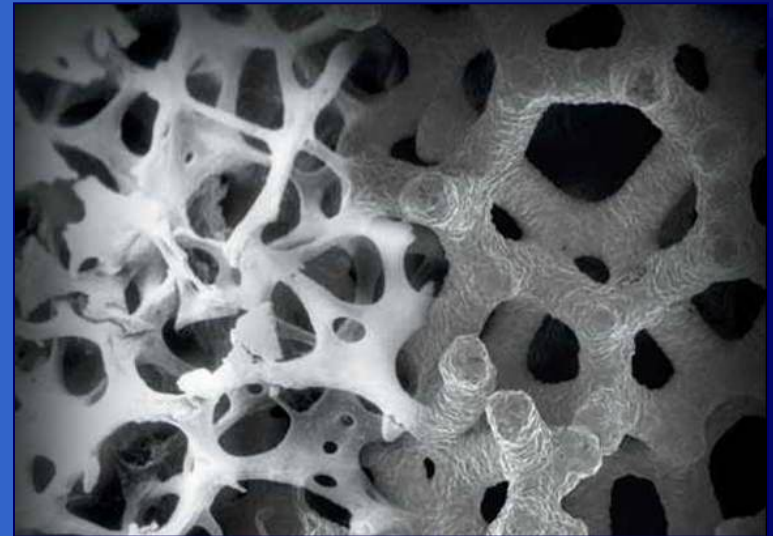
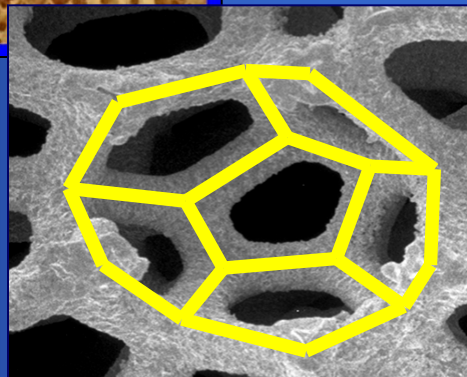
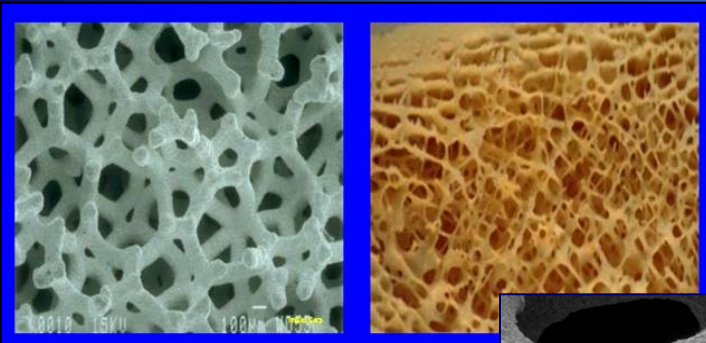
Reconstruction of the rotation center of the hip after oblong cups in revision total hip arthroplasty

Eduardo García-Rey · Ricardo Fernández-Fernández ·
David Durán · Rosario Madero

- Forty-five patients (46 hips)
- Paprosky: type 2B, 17 hips; 2C, 12 hips; type3A, 15 hips; type 3B, two hips
- Two different uncemented oblong cups (BOFOR, LOR)
- Acetabular reconstruction was achieved in most hips regardless of bone defect
- The mean follow-up was 7.2 years
- The **survival rate** for re-revision due to aseptic loosening was 60.1 %, for radiological loosening was **40.54%**
- No differences between the two assessed designs
- **We recommend careful evaluation of the patient before these types of devices are used for revision hip surgery**

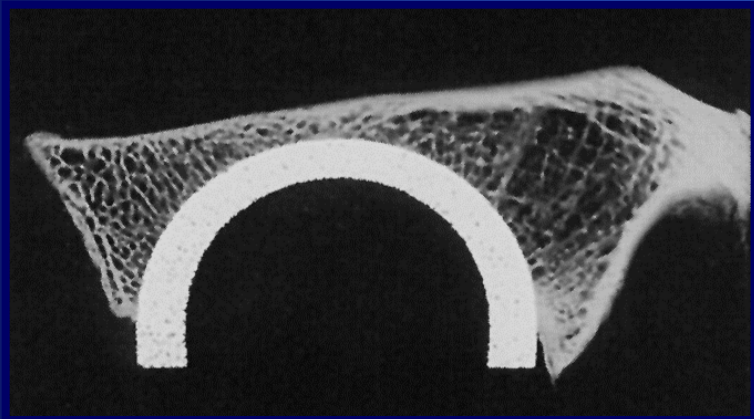
IL TRABECULAR METAL

- Introdotto nella pratica ortopedica nel 1997
- Superficie porosa fra il 75% e l'80% del suo volume totale
- Diametro medio dei pori 550 μm
- Microstruttura osteoconduttiva



IL TRABECULAR METAL

- Coefficiente di frizione sull'osso circa il doppio rispetto ad altri biomateriali porosi di superficie
- Componente acetabolare nella P.T.A. sviluppato per migliorare le proprietà di fissazione



IL TRABECULAR METAL

- Using quantitative CT scan, reported an increase in bone mineral density around tantalum acetabular implants compared with titanium implants, again suggesting superior bone ingrowth into the implant
(Meneghini RM et al, J Arthroplasty 2009;25:741–747)
- We found no evidence of osteolysis at 10 years on helical CT with a metal suppression protocol in patients who had a THA with a monoblock porous tantalum acetabular cup
(Moen TC et al. Clin Orthop Relat Res (2011) 469:382–386)

ORIGINAL PAPER

Cementless acetabular revision: past, present, and future

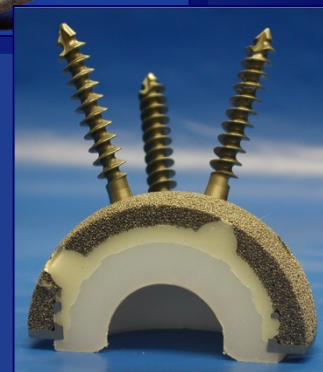
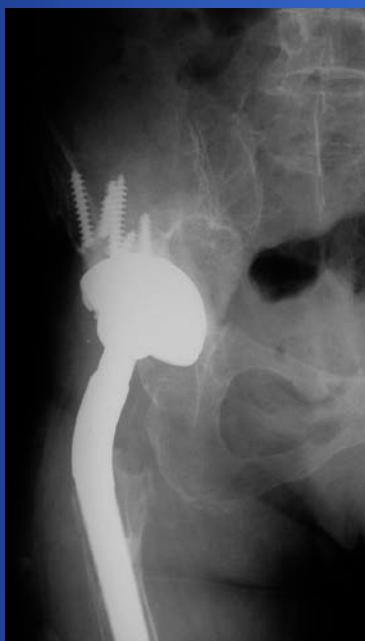
Revision total hip arthroplasty: the acetabular side using cementless implants

Luis Pulido · Sridhar R. Rachala · Miguel E. Cabanela

Table 2 General characteristics of highly porous metal coatings for acetabular revision

Biomaterial properties	Trabecular metal	Tritanium	Regenerex	Stiktite	Gription
Metal coatings	Tantalum	Titanium	Titanium	Titanium	Titanium
Modulus of elasticity (GPa)	2.5–3.9	106–115	1.6	NA	NA
Average pore size	550 μm	616 μm	300 μm	200 μm	300 μm
Porosity	75%	60%	67%	60%	63%
Coefficient of friction	0.88	0.65	NA	96–100	1.2

- La stabilità periferica permette l'iniziale fissazione meccanica della componente e quindi la successiva fissazione biologica (*in-growth/on-growth*)



C.T. ♀ a. 54

MATERIALE E METODO

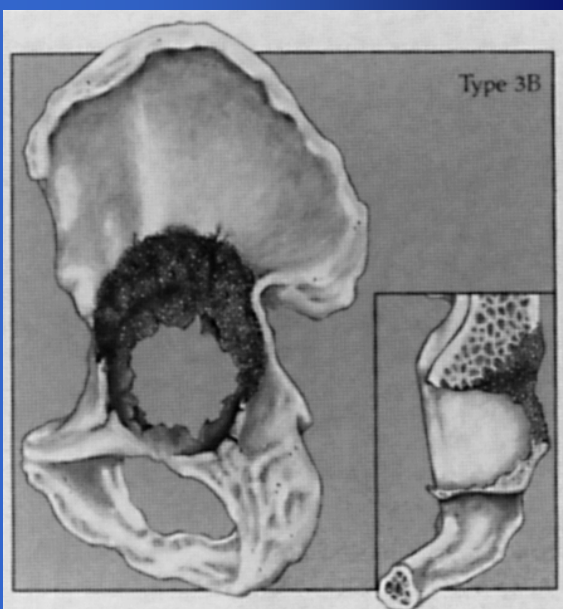
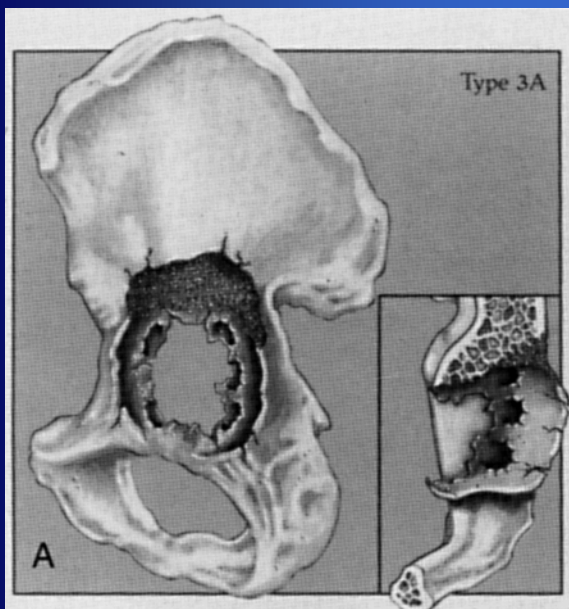
40 pz. (28 ♂ - 12 ♀) - età media 68 anni

- Revisione: dopo 8.9 aa (*10 m.-19 a.*)
- Mobilizzazione asettica 36 casi (90%)
- Harris Hip Score preop. 28.5
- Hardinge 29 casi / 11 osteot. transtrochant.
- Revisione solo compon. acetabolare: 10 casi
- Paprosky IIIA (12 casi) e IIIB (9 casi)
- Augment in 7 casi (*IIIA in 5, IIIB in 2*)

Follow-up medio: 55 mesi (34-84 m.)

Nessun fallimento clinico radiografico

Harris Hip Score 78



IIIA "Up and Out"

Lateral to Kohler's line. Intact medial support
 Moderate ischial lysis (<15 mm below superior obturator line)
 Medial limb of teardrop is intact
 Superior and lateral migration "up and out"
 Contact of trial with bone over 40–60%
 Intact ilioischial and iliopubic

IIIB "Up and In"

Broken Kohler's line. No medial or superior support
 Extensive ischial osteolysis (>15 mm below superior obturator line)
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 Under 40% contact surface. High risk of occult pelvic discontinuity

Pelvic discontinuity

Fracture line through columns
 Broken Kohler's line or obturator foramen asymmetry on AP pelvis
 Superior and inferior hemipelvis separation

Tipo IIIB: DIFETTO MEDIALE

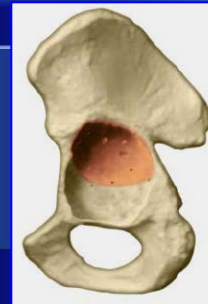


“Up and in”

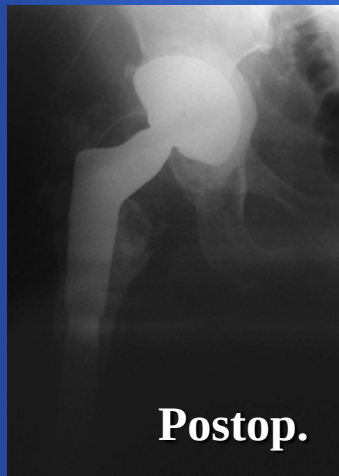


L. M. a. 80 ♀

Tipo IIIA: DIFETTO CAVITARIO



“Up and out”



V.C. ♀ a. 73

Tipo IIIA: DIFETTO CAVITARIO



“Up and out”



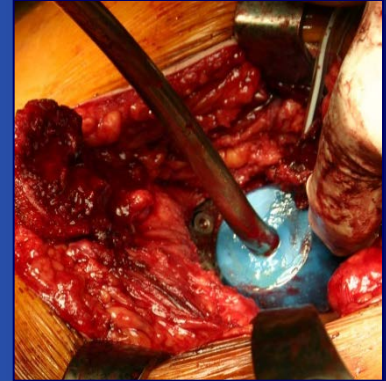
2010
f.up 16 aa.

G. A. a. 77 ♂

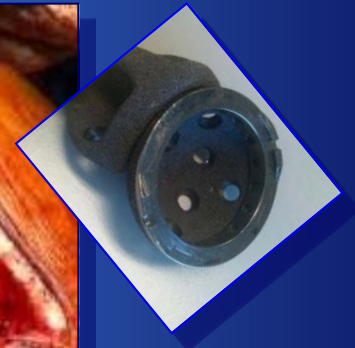
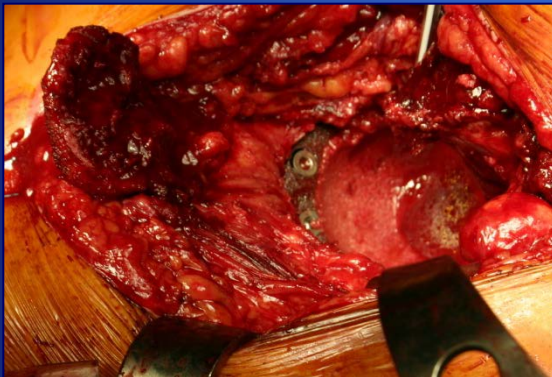
- Decubito laterale; approccio sec. Hardinge
(transtrocanterico/transfemorale se necessario)
- Frese acetabolari per ottenere il miglior press-fit possibile della coppa di prova tra le pareti anteriore e posteriore dell'acetabolo
- Sede dei difetti ossei spesso posterosuperiore
- Augment utilizzato se componente emisferica senza adeguato supporto



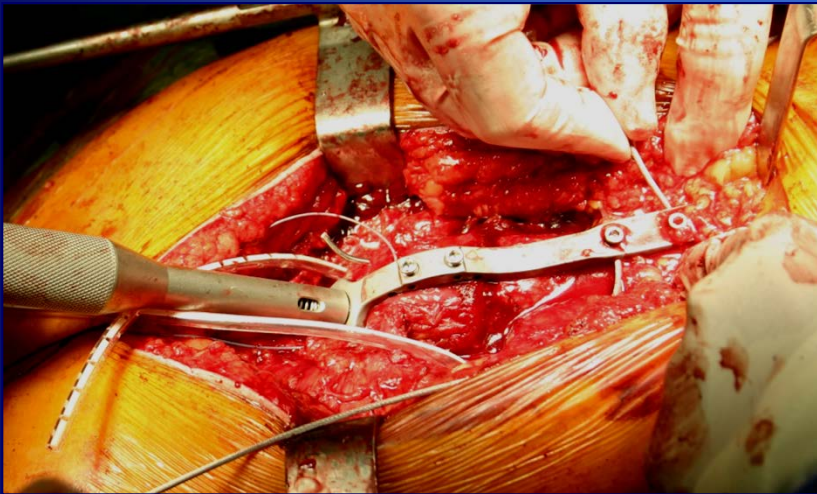
- Osso di banca morcellizzato nel difetto mediale ed all'interno dell'augment



- Non cementazione dell'interfaccia augment-coppa
Siegmeth et al. Clin Orthop Relat Res 467:199–205, 2009



- Ev. revisione dello stelo
- Osteosintesi trocanterica/femorale con placche dedicate



Tipo IIIA: DIFETTO CAVITARIO



“Up and out”



L. A. a. 57 ♀

Tipo IIIA: DIFETTO CAVITARIO



“Up and out”



M. C. a. 54 ♀

DISCUSSIONE

Clin Orthop Relat Res (2010) 468:459–465
DOI 10.1007/s11999-009-1090-5

SYMPOSIUM: PAPERS PRESENTED AT THE HIP SOCIETY MEETINGS 2009

Do Tantalum and Titanium Cups Show Similar Results in Revision Hip Arthroplasty?

S. Mehdi Jafari MD, Benjamin Bender MD, Catelyn Coyle BA,
Javad Parvizi MD, FRCS, Peter F. Sharkey MD, William J. Hozack MD

Table 2. Distribution of the lucent zones around cups in minor and major bone deficiency groups

Group	Number of lucent zones				Chi square	p Value
	0	1	2	3		
Minor group						
Titanium cup	169 (87.6%)	10 (5.2%)	9 (4.6%)	5 (2.6%)	0.18	0.67
Tantalum cup	48 (87.3%)	5 (9.1%)	1 (1.8%)	1 (1.8%)		
Major group						
Titanium cup	9 (42.9%)	4 (19%)	5 (23.8%)	3 (14.3%)	5.01	0.02
Tantalum cup	22 (84.6%)	0	2 (7.7%)	2 (7.7%)		

DISCUSSIONE

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Table 3. Time to failure of titanium and tantalum acetabular cups

Group	Time to failure		p Value
	Early (< 6 mo)	Late ($\geq$ 6 mo)	
Both groups			
Titanium cup	3 (17.7%)	14 (82.4%)	0.01
Tantalum cup	4 (80%)	1 (20%)	
Major group			
Titanium cup	0	5 (100%)	0.05
Tantalum cup	2 (66.7%)	1 (33.3%)	
Minor group			
Titanium cup	3 (25%)	9 (75%)	0.05
Tantalum cup	2 (100%)	0	

Tantalum Components in Difficult Acetabular Revisions

Paul F. Lachiewicz MD, Elizabeth S. Soileau BSN

- 39 hips classified Paprosky Type 3 in 26, Type 2 in 11, and Type 1 in two hips
- Nonmodular revision shell with cemented polyethylene liner in 12 hips and the modular shell in 27 hips
- Augments were used in four hips
- Followup time was 2 to 7 years
- Bone ingrowth was apparent in 38 hips

Trabecular Metal Used for Major Bone Loss in Acetabular Hip Revision

Jonah Hebert Davies, MD, G. Yves Laflamme, MD, FRCSC,
Josee Delisle, RN, BScN, MSc, and Julio Fernandes, MD, MSc, PhD, MBA

- 46 patients of 66.7 years (range,39-85): IIc 22%, IIIa 44%, IIIb 25%, Pelvic discontinuity 9%
- The nonmodular TM shell was used in all cases
- If the location of the screw holes within the shell were insufficient, we drilled custom screw holes using a high-speed burr, finally a posterior lipped cross-linked polyethylene cup was cemented into the shell
- Mean follow-up was 50 months (range, 28-76)
- There were no cases of aseptic loosening. Non progressing periacetabular radiolucencies in 5 patients

Porous tantalum shells and augments for acetabular cup revisions

Andrej Moličnik · Marko Hanc · Gregor Rečnik ·
Zmago Krajnc · Mitja Ruprecht · Samo K. Fokter

- 25 patients
- 11 type IIa–b, 4 type IIc, 6 type IIIa, 3 type IIIb, and 1 type IV (pelvic discontinuities) acetabular defects
- Follow-up of 12 to 42 months
- Only modular shell TM cups were used in 15 cases (60 %), augments were required in 9 (36 %) cases, and a cup-cage construct was implanted in one case of pelvic discontinuity
- 24 cups demonstrated no lucent lines and 1 cup had lucent lines but remained well fixed

Early Results of 827 Trabecular Metal Revision Shells in Acetabular Revision

Eerik T. Skyttä, MD, PhD,*†‡ Antti Eskelinen, MD, PhD,*
Pekka O. Paavolainen, MD, PhD,§ and Ville M. Remes, MD, PhD||

- 827 acetabular revisions with Trabecular Metal Revision Shell using data from a nationwide arthroplasty register
- Due to aseptic loosening of the cup or both prosthesis components in 330 cases (40%)
- The **3-year survivorship was 98%** using revision for aseptic loosening of the socket as end point
- The most common reason for revision was **dislocation** of the prosthesis, followed by aseptic loosening, periprosthetic fracture 10%, and infection of operations.
- **Hospital volume did not have any statistically significant effect on survivorship**

REVIEW

Options for managing severe acetabular bone loss in revision hip arthroplasty. A systematic review

Sameer Jain¹, Richard J. Grogan¹, Peter V. Giannoudis²

- A total of **50 articles of level IV** scientific evidence comprising 2415 patients (**2480 hips**)
- Acetabular revision surgery in the presence of **severe bone loss** (defined as more than 50%)
- **REINFORCEMENT DEVICES**: 24 studies, 1198 pts, mean f-up 5.9 yrs - mean revision rate of 8.2% and **a mean complication rate of 29.21%**
- **CUSTOM-MADE TRIFLANGED COMPONENTS**: 5 studies, 193 pts, mean f-up 6 yrs - **mean revision rate of 15.9%** and a complication rate of 24.5%
- **JUMBO CUPS**: 8 studies, 552 pts, mean f-up 7 yrs - mean revision rate of 8.8% and a complication rate of 18.4%
- **TM SYSTEMS**: 13 studies, 486 pts, mean f-up 3.9 yrs - mean revision rate of 8.5% and a complication rate of 18.5%

CONCLUSIONI

*Il **cotile in tantalio**, con la possibile **modularità**, ha pienamente risposto ai presupposti che ne hanno suggerito l'utilizzo nella chirurgia di revisione.*

*Solo l'ulteriore esperienza potrà dimostrarne l'**effettivo vantaggio** rispetto ad altri validi sistemi.*





*“Change is one thing,
progress is another”*

*Bertrand Russell
(1872–1970)*

GRAZIE

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