

# The use of Custom-Made Antibiotic Cement Nails for the treatment of resistant acute infections related with fracture nailing osteosynthesis

L. Font-Vizcarra, M. Veloso, L. Gomez, S. Huguet, A. Matamala, F. Angles

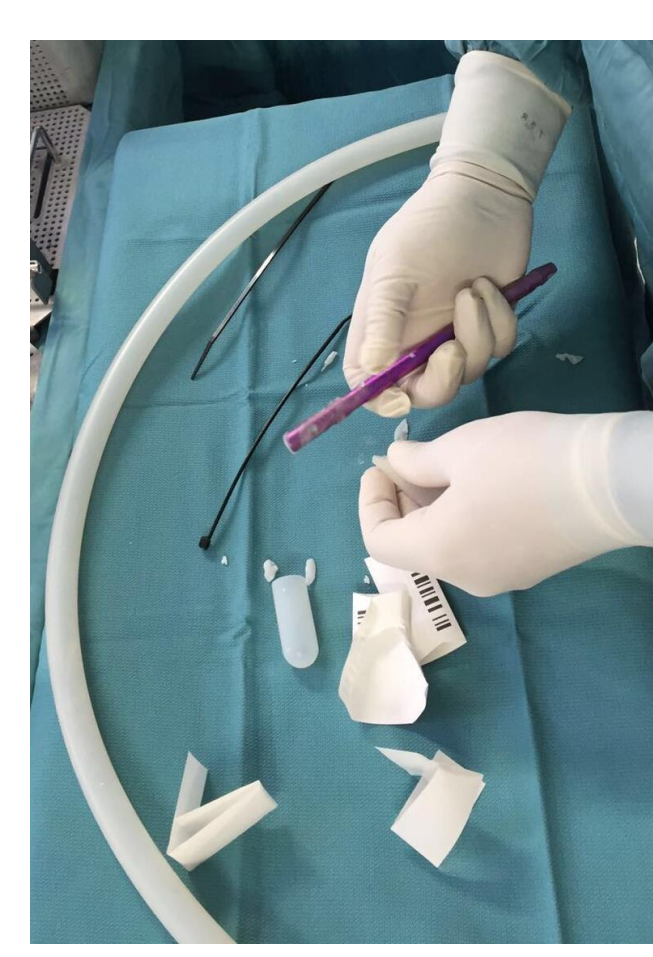
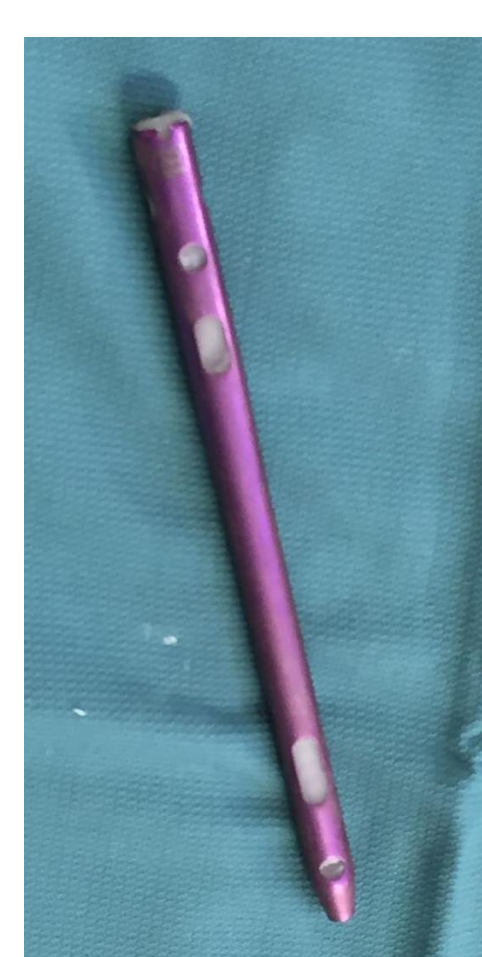
HOSPITAL UNIVERSITARI MUTUA TERRASSA

## INTRODUCTION

Debridement and implant retention (DAIR) is the treatment of choice after an acute infection related with fracture osteosynthesis. However, in the some cases of intramedullary nailing, due to the difficulty for achieving a total debridement, DAIR is not effective and it is necessary to remove the initial nail. To avoid the bacterial colonization of the new osteosynthesis and to achieve a high antibiotic concentration dose in the focus of fracture, we decided to cover the new implant with antibiotic cement.

## MATERIALS AND METHODS – SURGICAL TECHNIQUE

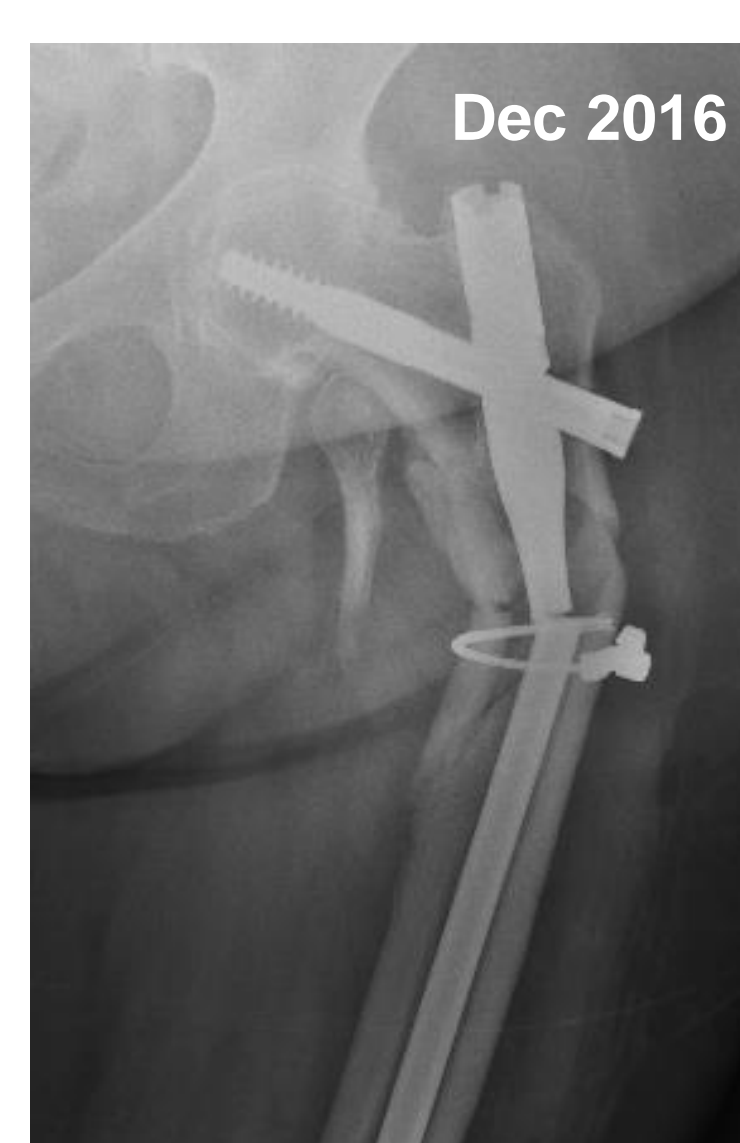
A previously sterilized silicon tube is used as mold. The interlocking nail is introduced into the tube. Using nylon flanges the end of the tube is sealed and the nozzle of the cement gun is subjected to the other end of the silicon tube. With a marker pen, the holes of the nail are marked in the tube. While the cement is introduced into the tube other surgeon helps the distribution of the stuff to ensure a uniform cement mantle. After the cement has set, we drill the holes and the silicone tube is split longitudinally with a sharp knife.



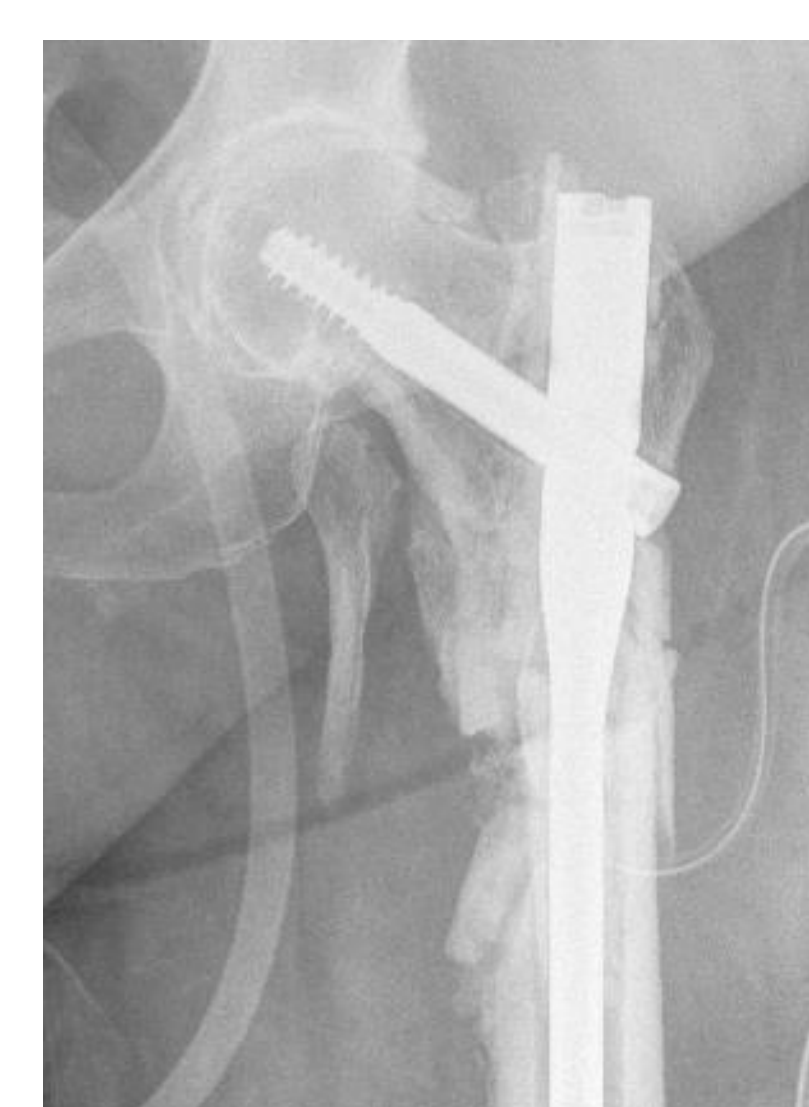
Trick: To avoid cement ingress, the holes may touch with bone wax

## RESULTS

### Case 1: W 73 y.o.



1- Replacement by a new long nail but...  
2- Acute *P. mirabilis* infection  
3- One not successful DAIR  
A two stage treatment is planned:  
1<sup>st</sup> stage: Radical debridement + cement nail + cement in bone defect

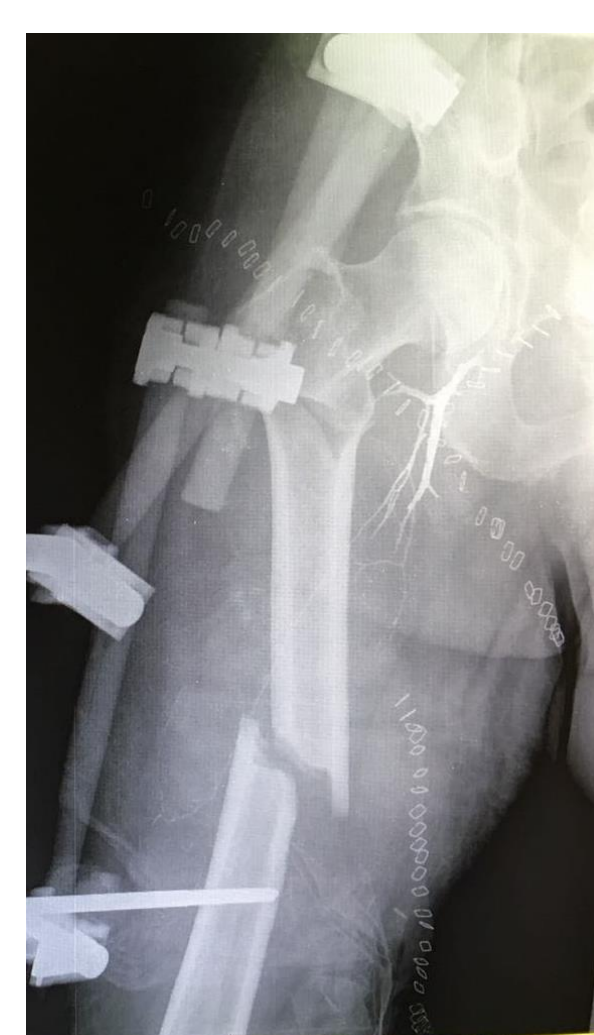


After 2 months of antibiotic treatment and a period of clearance a non-cemented revision total hip replacement is performed



### Case 4: M 41 y.o.

9 Feb 2016  
Polytraumatism with open bifocal femoral fracture and vascular injury



25 Feb 2016  
He is admitted to our hospital in this situation.  
Despite 2 DAIR's and VAC therapy the infection is not resolved so...



In April 2016 hand-made antibiotic cement nail is implanted.  
After 2 month of VAC therapy Plastic Surgery Department performed a Split-thickness graft



Sex (age) <sup>o</sup>	bone defect	previous DAIRs	bacteria	Follow-up (months)	Bone healing	Control of infection	Actual situation
1- woman (73)	5 cm	1	P. Mirabilis	9	No	Yes	Active rehabilitation
2- woman (80)	No	2	S. Epidermidis	27	Yes	Yes	Asymptomatic
3- male (24)	No	1	P. Acnes	39	Yes	Yes	Asymptomatic
4- male (41)	No	2	St. Maltophila	17	Yes	Yes	Asymptomatic

## DISCUSSION AND CONCLUSIONS

Although the use of antibiotic cement nail has been reported previously for the treatment of septic non-unions, the bibliography focused in their use in acute infections is scarce. Although we presented a short series of cases and obviously more studies with more patients are necessary, it seems that it could be a good alternative to control the acute infections related with fracture nailing osteosynthesis when DAIR has been not effective.