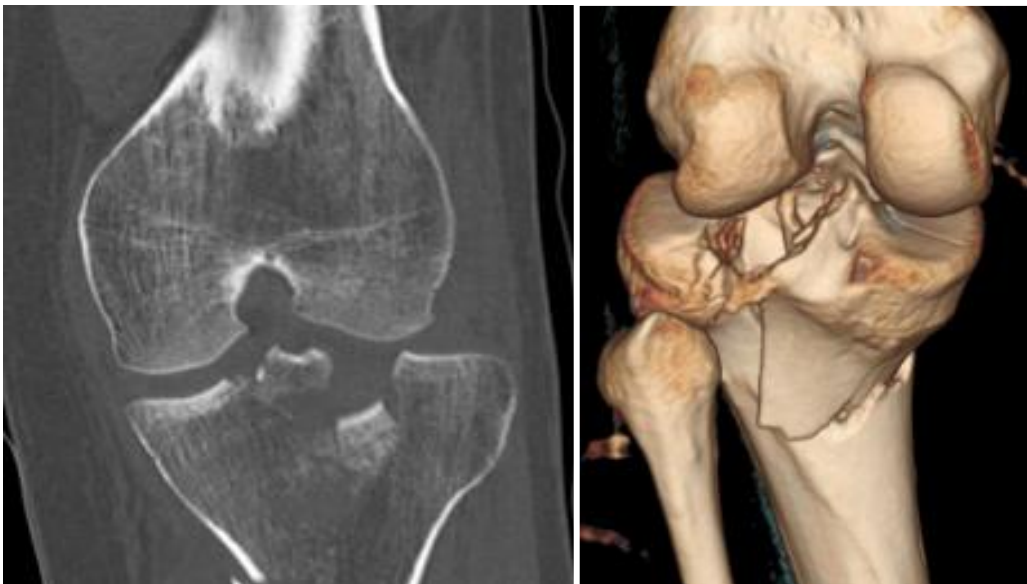


Introduction& Patient Profile

- 35 years-old women
- A complex plateau tibial fracture

Pre-operative Scan & Radiography



Pre-operative AP Scan

Surgical Plan

- ORIF with plate, screws and wires
- Filling of the defects with Graftys®Quickset & HBS

Hypothesis

Using an injectable calcium phosphate bone substitutes Graftys®Quickset & HBS may fulfill the plateau tibial defects as a bone void filler and allow early mobilization and functional recovery.

Surgical Technique

- ORIF, Plate, screws and wires
- Injection of Graftys®Quickset & HBS into bone defects

Immediate postoperative care

- Bracing using a custom-made articular bracing

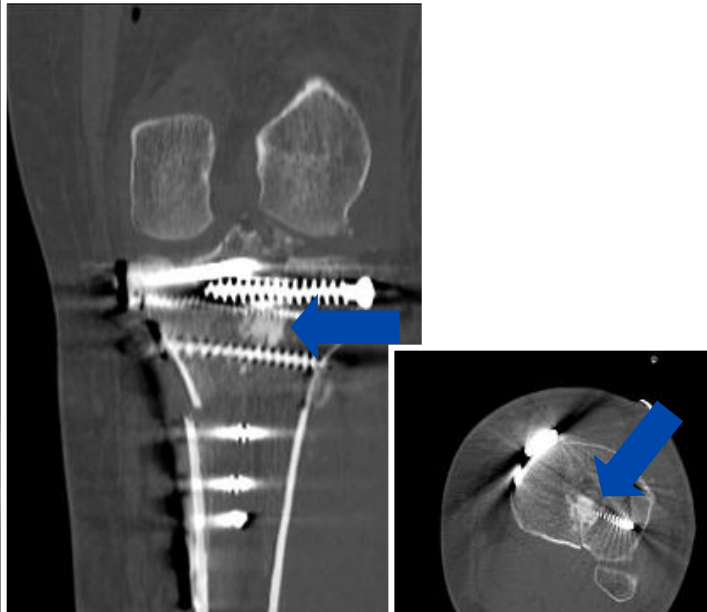
Clinical case

- Immediate passive manual range of motion rehabilitation
- No weight-bearing during 3 months

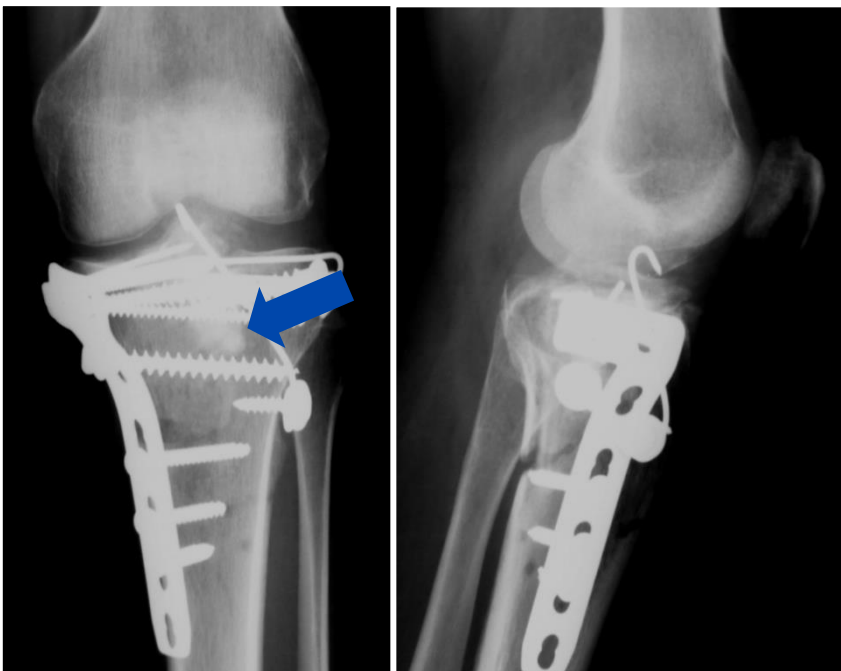
Postoperative scan & radiography



Immediate postoperative AP X-Ray



Immediate postoperative Scan



3 months postoperative AP & ML X-Ray

X-Ray Analysis:

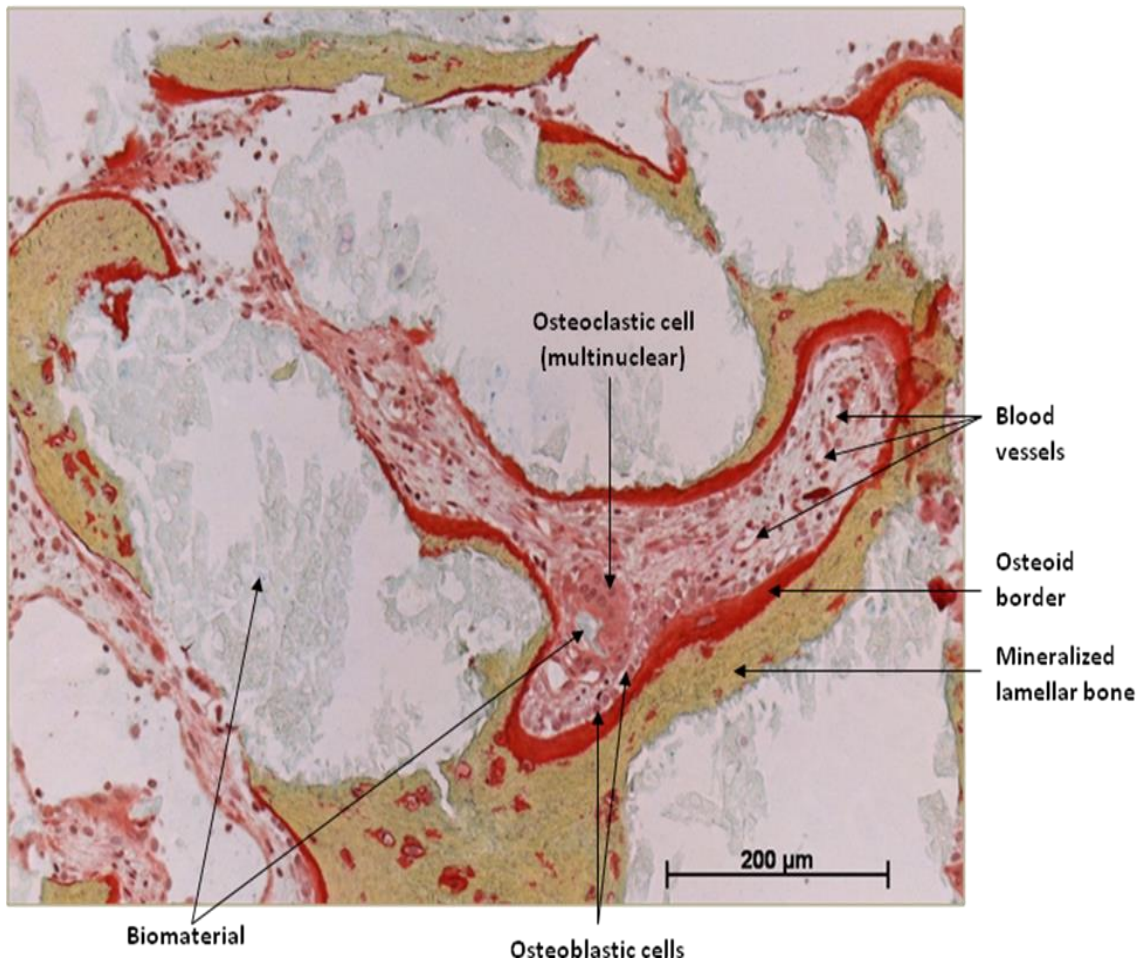
We observe a good osseointegration and an homogenous interface between Graftys®Quickset & HBS and bone.

- **4 months postoperative,**

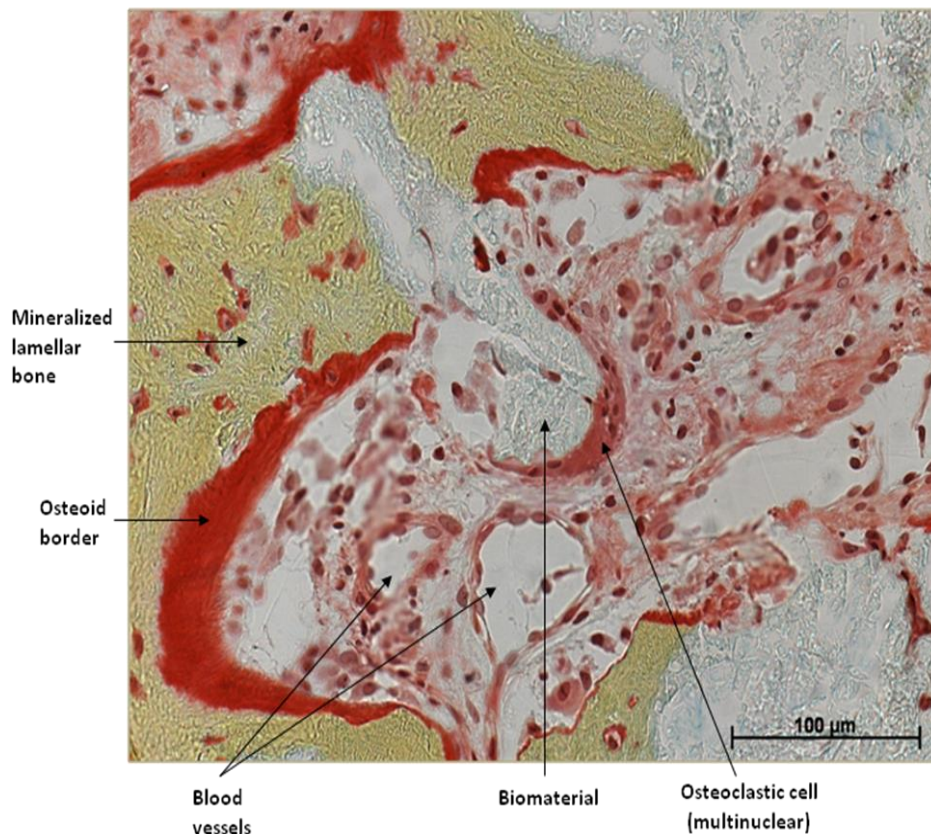
Wires & screw were withdrawn to allow early mobilization of the patient. During the withdrawn, a biopsy was made to allow histological analysis.

4 month postoperative histology:

X 10



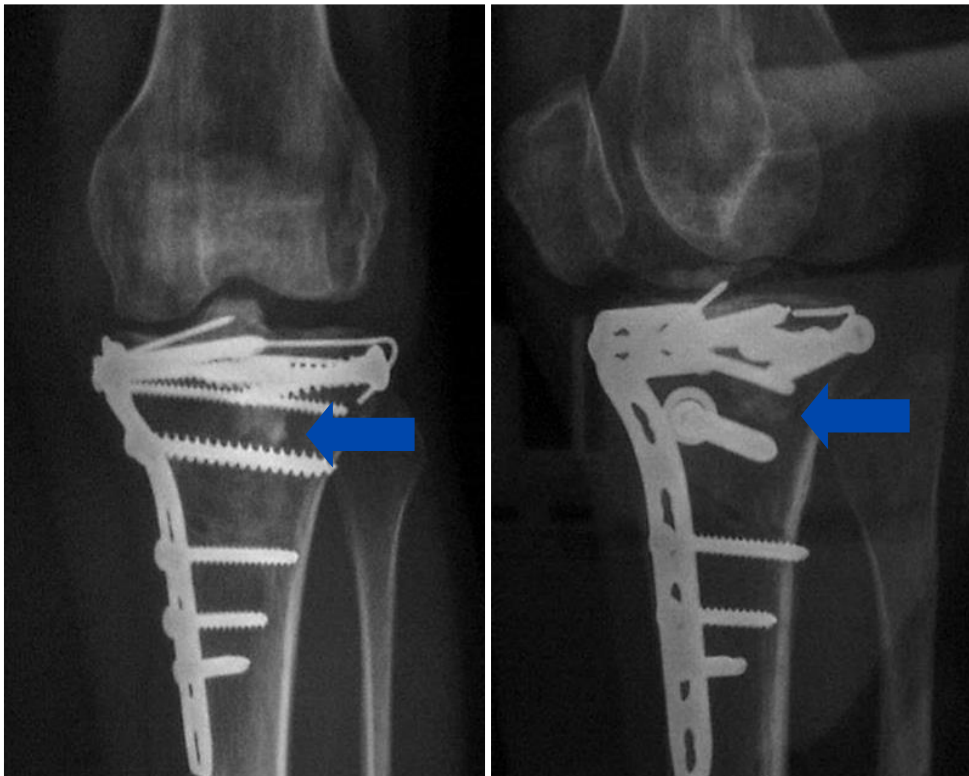
X 20



4 months histological Analysis:

- Good osseointegration of the Graftys® Quickset & HBS (in blue) in direct contact with new bone trabeculae (no fibrous interface)
- A very close intertwining between biomaterial (in blue) in degradation process and mineralized lamellar bone (in brown)
- Presence of osteoblastic cells (cuboid) in relation to osteoid borders in mineralizing process
- In direct contact, osteoclastic cells (multinuclear cells) are resorbing the biomaterial
- Presence of numerous blood vessels

Clinical case



8 months postoperative AP & ML X-Ray

X-Ray Analysis:

- A good osseointegration and a homogenous interface between Graftys® Quickset & HBS and bone.
- A resorption of the biomaterial in progress

At 8 months post-surgery:

Clinical results:

- Painfree for the ADL
- Cycling OK
- Flexion 120°
- Extension 0°
- Stable

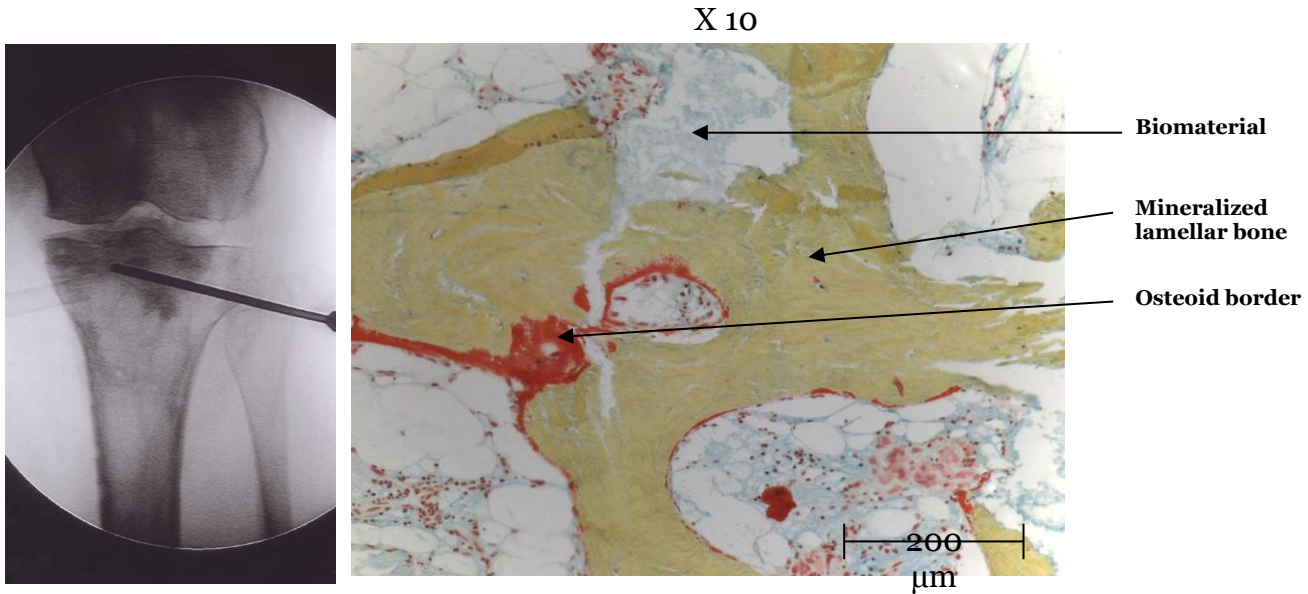
Radiological results:

- Fracture healing
- Restoration of the articular congruency

1 year and 10 month postoperative histology:

Wires & screw were withdrawn. During the withdrawn, a biopsy was made to allow histological analysis.

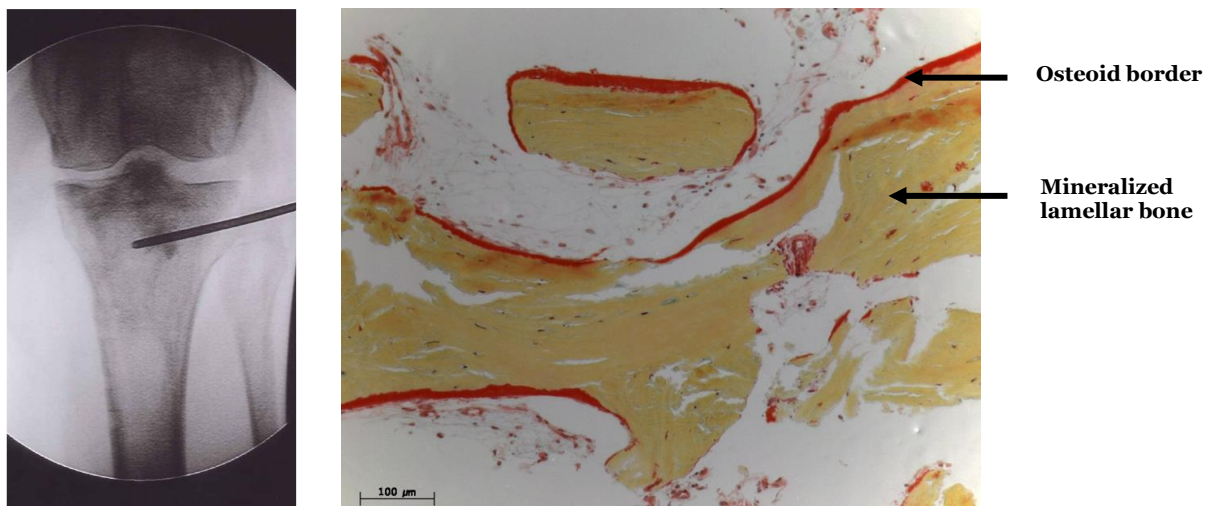
Biopsy 1: Into injected area



Analysis:

- Very good osseointegration of little remaining cement (Graftys®Quickset & HBS) (in blue) in direct contact with new mineralized lamellar bone (in brown).
- Recolonization of injured area by bone marrow and absence of inflammatory cells.

Biopsy 2: Close to injected area



Clinical case

Analysis:

- Active bone remodeling suggesting the presence of close cement in degradation process

2 years postoperative X-Rays (2 months after material removal):



2 years postoperative AP & ML X-Ray



Extension and flexion at 2 years

Analysis:

- 2 years after surgery and after hardware removal
- Painfree
- Resorbtion of the graft is almost completed

(1) **Bajammal S.S. et al. 2008.** The Use of Calcium Phosphate Bone Cement in Fracture Treatment. A Meta-Analysis of Randomized Trials. *J.Bone Joint Surg. Am.* 90 (A), vol 6: 1186-96.

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