Percutaneous Cementoplasty: How I do it

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Disclosures

- NOTHING TO DISCLOSE

Percutaneous Cementoplasty

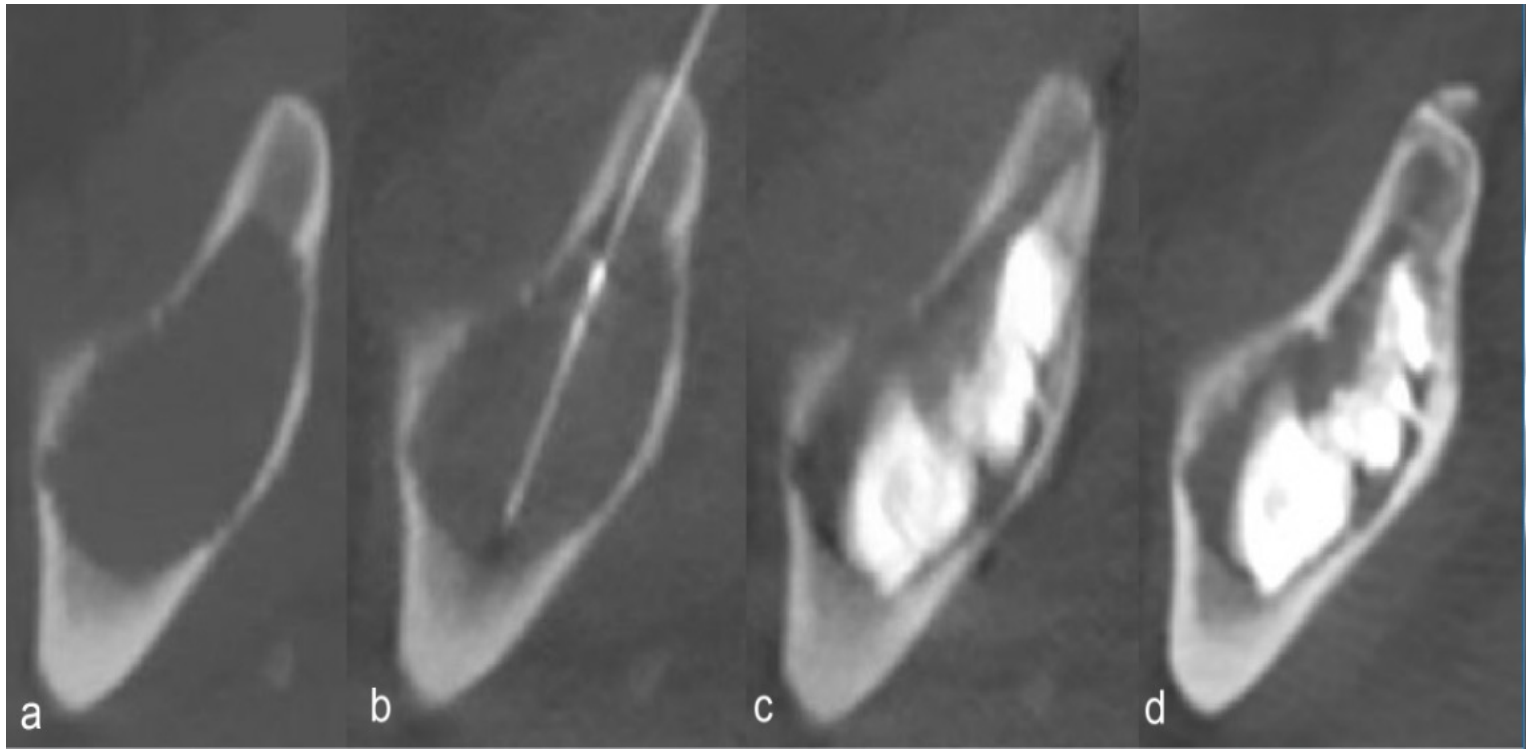
- PC was described for the first time in 1987: aggressive hemangioma
- Treatment of painful osteoporotic and malignant VCFs: Pain alleviation and to provide bone consolidation
- Extra-spinal PC or osteoplasty is effective in the management of painful extra-spinal lesions. Bone consolidation in critical areas: acetabulum: Fx prevention
- PC in long bones: Cement can be used in combination with nails/other devices to enhance the biomechanical stability
- Bone consolidation requires to fill as much as possible of the metastatic process

Percutaneous Cementoplasty

- 761 lesions in 652 patients. Mean size 45 mm. 65% pelvis and 33% long bones
- Main indication: Palliation 95%, prevention of Fx 5%
- PC as a stand-alone technique: 60%. Combined with thermal ablation: 26%
- Mean volume cement injected: 8.8 mL (2.7-32 mL)
- Postoperative VAS: reduction of the VAS of 5 points or more
- Nerve injury: most common symptomatic leakage (0.4%)
- Lack of standardization: volume of cement, needles (size, number), combined techniques (screws, pins, ablation),…

Garnon J. et al. Perc extra-spinal cementoplasty in patients with cancer: A systematic review of procedural details and clinical outcomes. Intervent Imaging 2019
Sun Y. Analgesia from percutaneous thermal ablation plus cementoplasty for cancer bone metastases. J Bone Oncol 2019

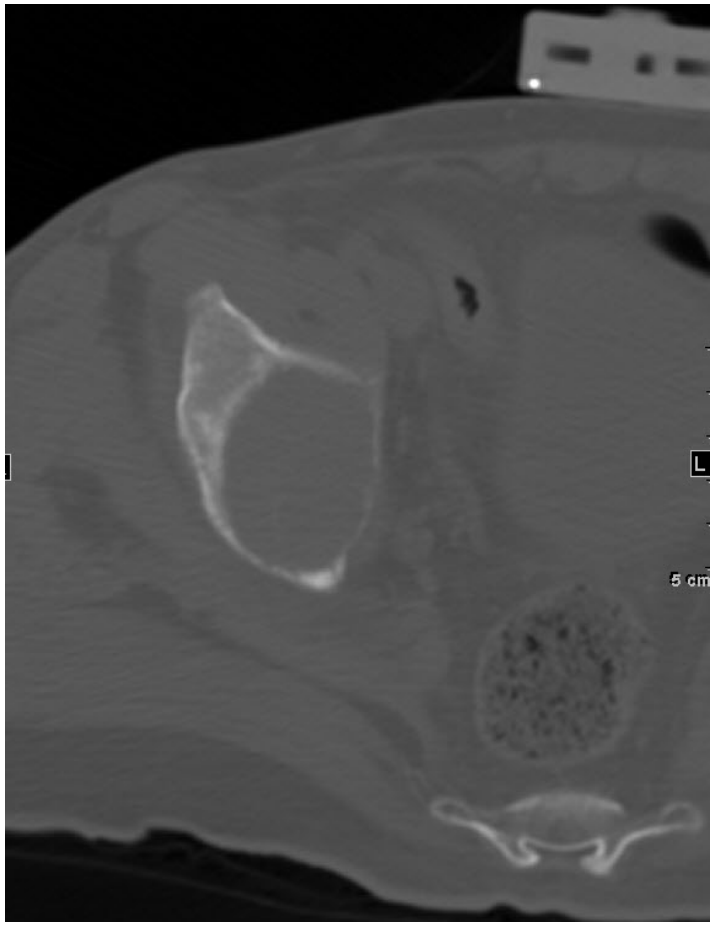
Percutaneous Cementoplasty: How I do it

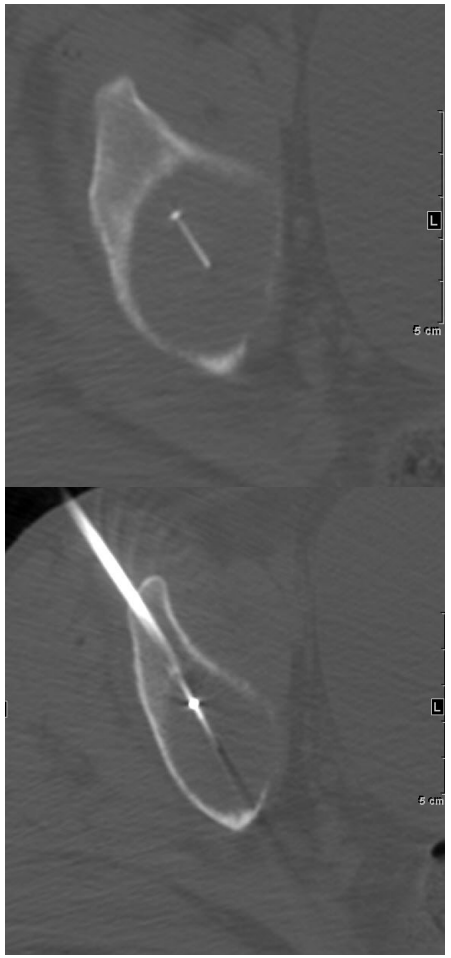


- Left supraacetabular metastasis in a male patient with metastatic RCC. Not a candidate for surgery or further radiation treatment. MWA of the lesion to achieve tumor control.
- 6 mL cement was deposited into the lesion.
- No balloon osteoplasty was used.
- Left supraacetabular area is intact five and a half years after percutaneous stabilization

Percutaneous Cementoplasty: How I do it

55 yo male with Hx of metastatic renal cell carcinoma to the bone. Palliative RT to the R pelvis 3 months ago. Worsening of R hip mechanical pain particularly with ambulation/standing (VAS 8/10)





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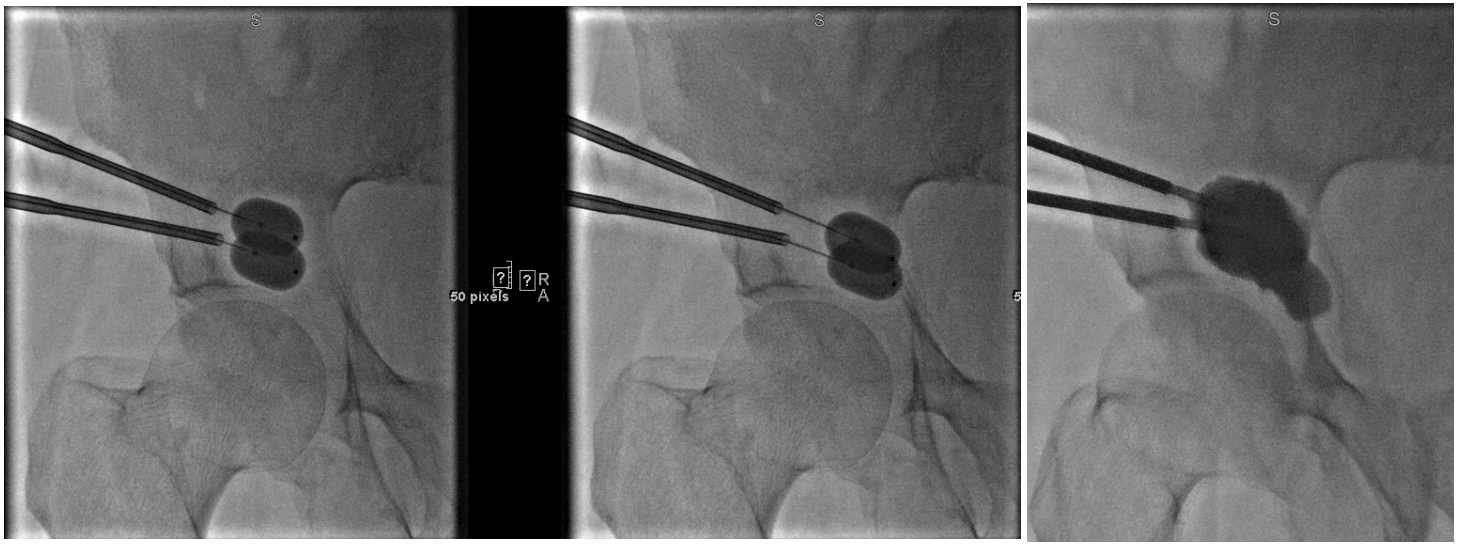
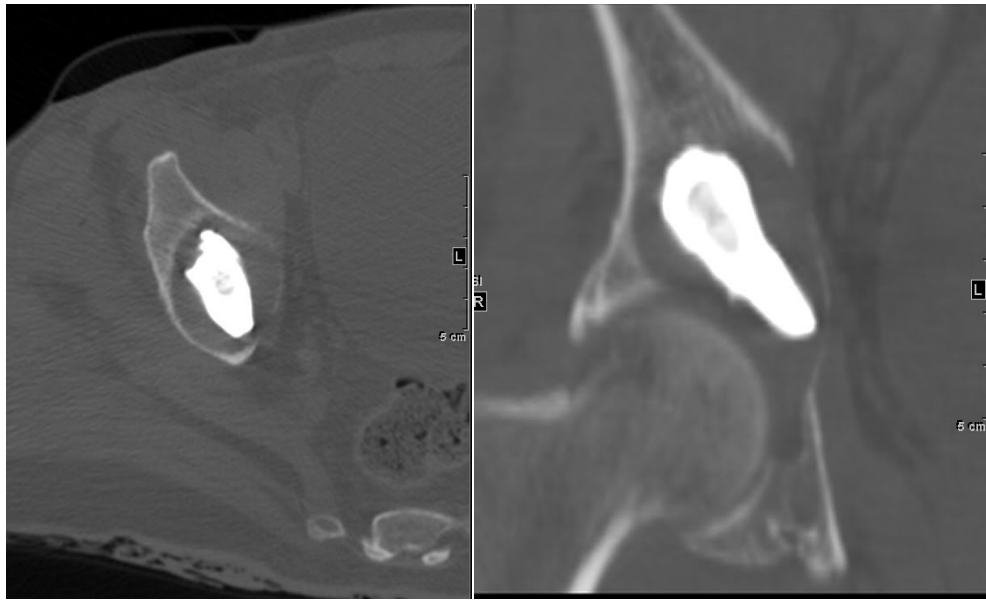
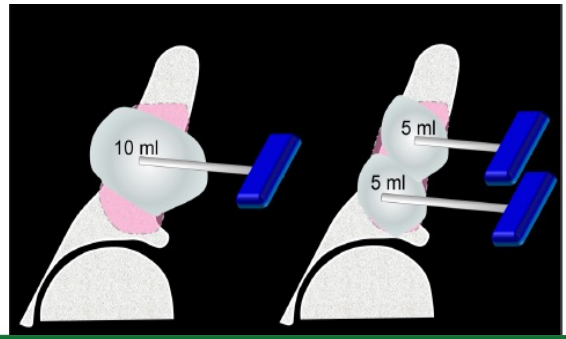




15 mL of cement

Prevention of cement leakage:

- Cavity creation with the kypho balloons: Injection of cement under low pressure
- More than one needle likely better to fill large defects. Simultaneous injection
- Continuous movement of the hip joint during the cement injection

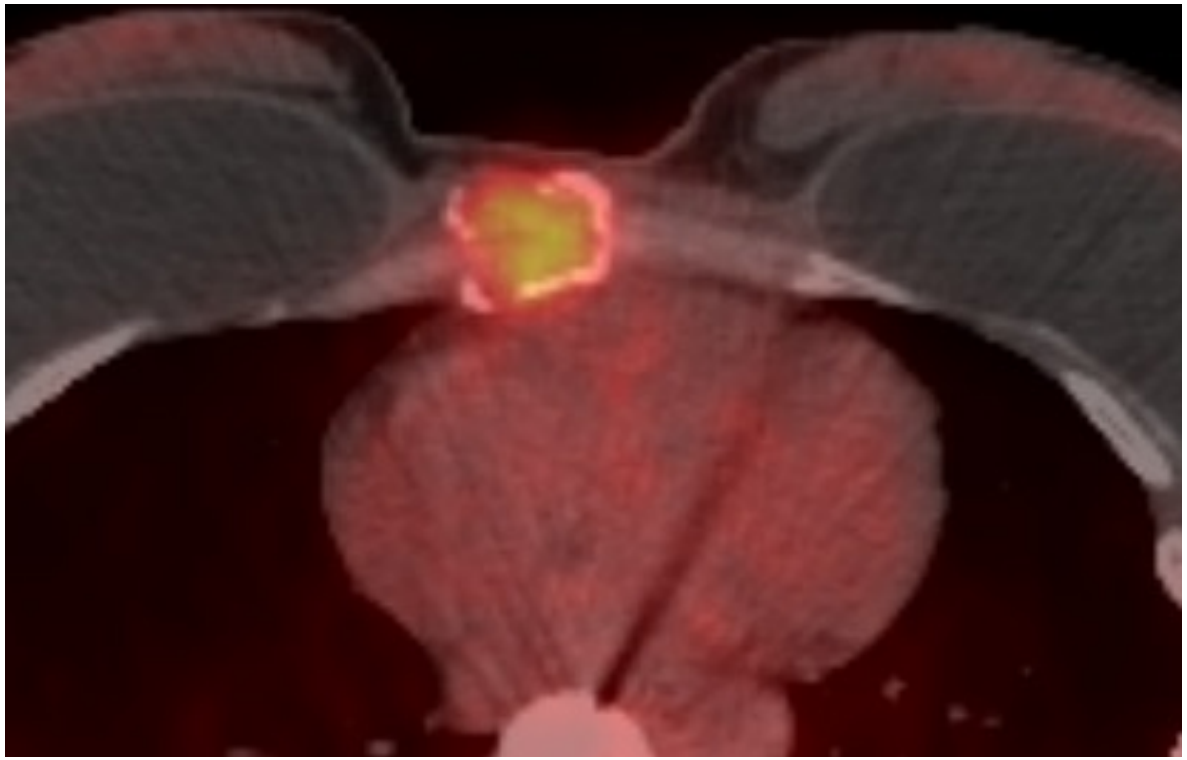


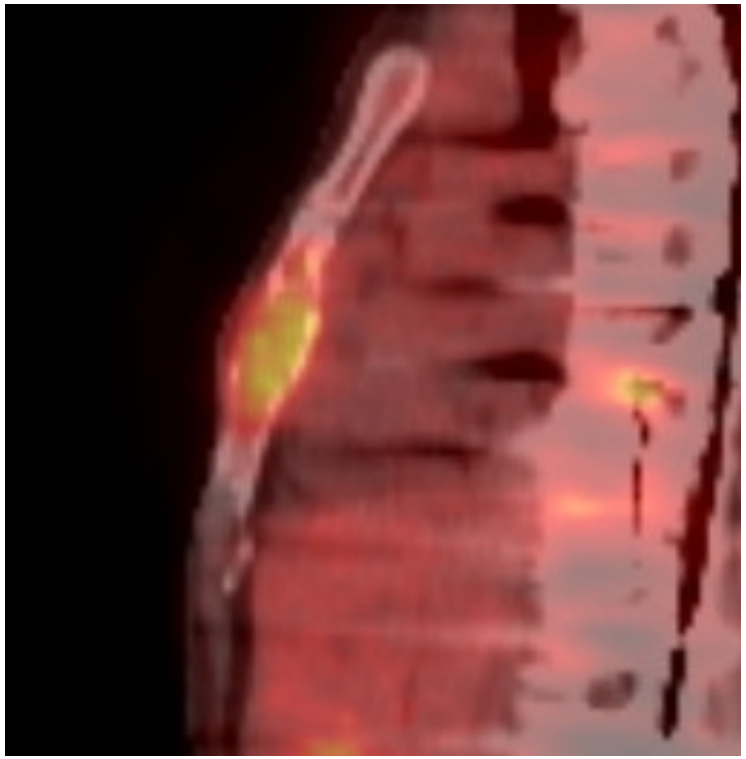
5 month follow up: Mild mechanical pain. VAS 2-3/10

Moser TP. Cementoplasty of pelvic bone metastases: systematic assessment of lesion filling and other factors that could affect the clinical outcomes. Skeletal Radiol 2019

Percutaneous Cementoplasty: How I do it

39 yo female with Hx of metastatic adamantinoma to bone s/p numerous surgical procedures (spine, hips, humerus). Rad Onc: pat not good candidate for RT due to prior RT to spine and proximity to the heart. Sternal pain with mechanical component: Biological pain 4/10, Incident pain 7-8/10.



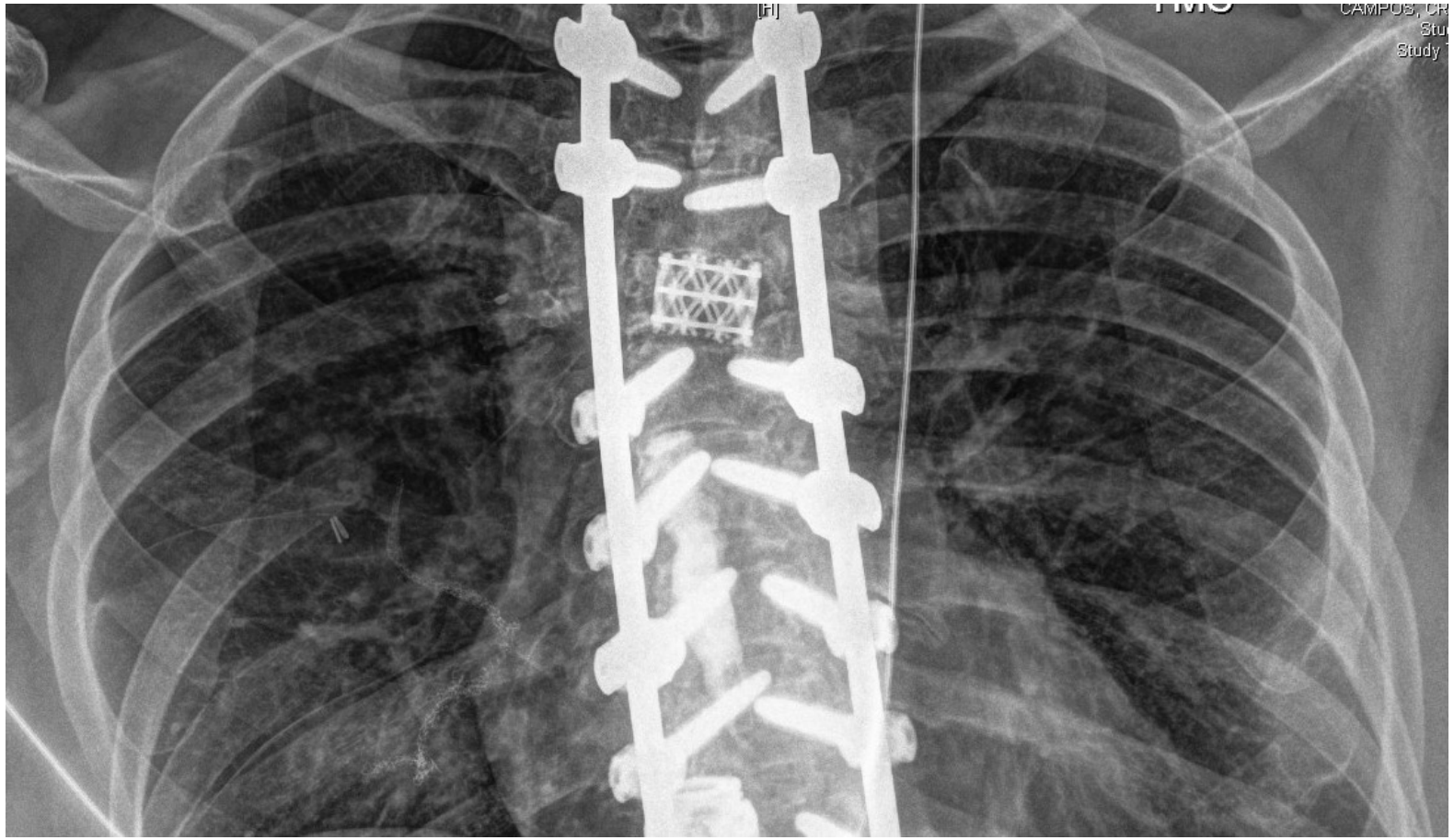


Percutaneous Cementoplasty: How I do it

Goals of the procedure: Tumor control and pain alleviation

- Initial needle placement with CT Nav and then, fluoroscopy (lateral) for probe placement, balloon assisted cementoplasty.
- Cryoablation: slow growth of the iceball. 5 cycles (40% up to 100%). Skin hydro-dissection (ultrasound)

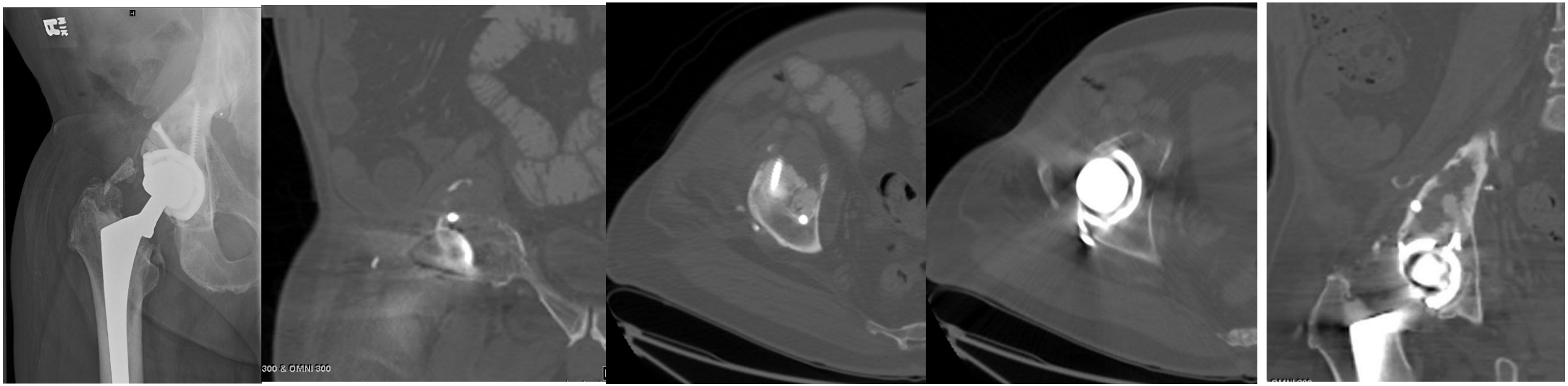
Percutaneous Cementoplasty: How I do it



1 month follow up:
VAS
At rest: 2/10
Incident pain: 4/10

Percutaneous Cementoplasty: How I do it

58 yo male with metastatic RCC. THR + iliac bone resection on 2014. 2017: 6 months of increased pain and mechanical instability of the pelvis and hip.



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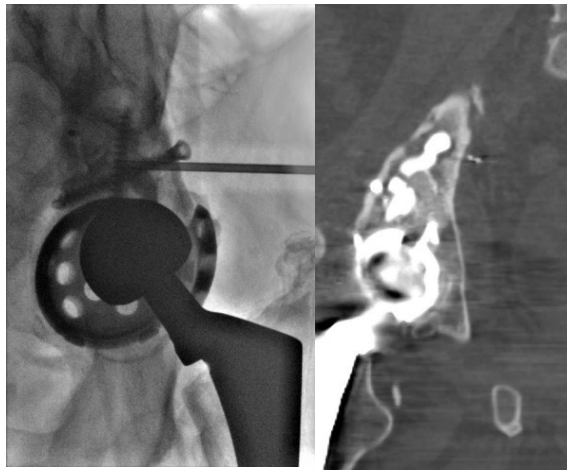
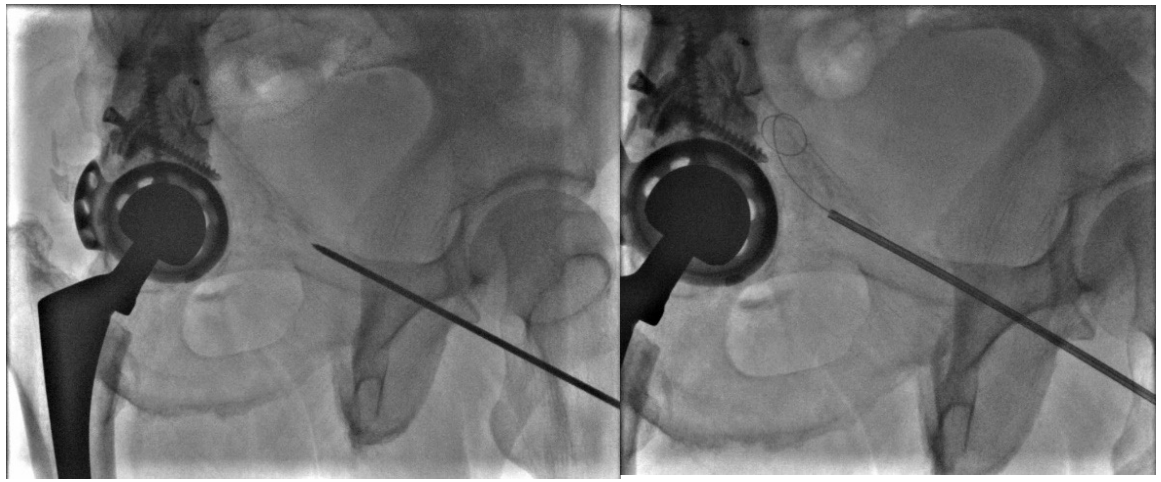
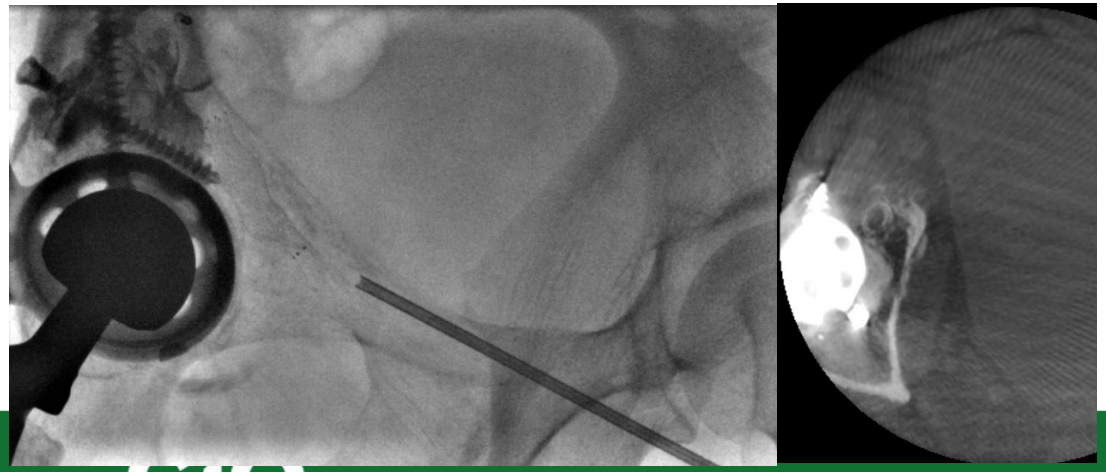
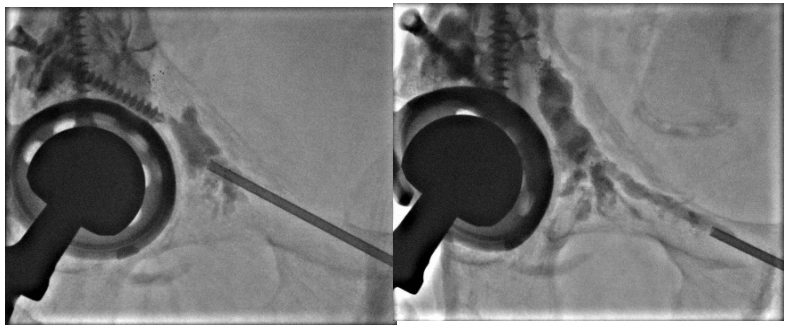








Stent assisted cement Injection to prevent leakage.

Pat did well for 16 months. Prosthetic infection requiring new hip replacement in 2019

Cornelis, F. Percutaneous low-pressure bone stenting to control cement deposition in extensive lytic lesions. Eur Radiol. 2017.

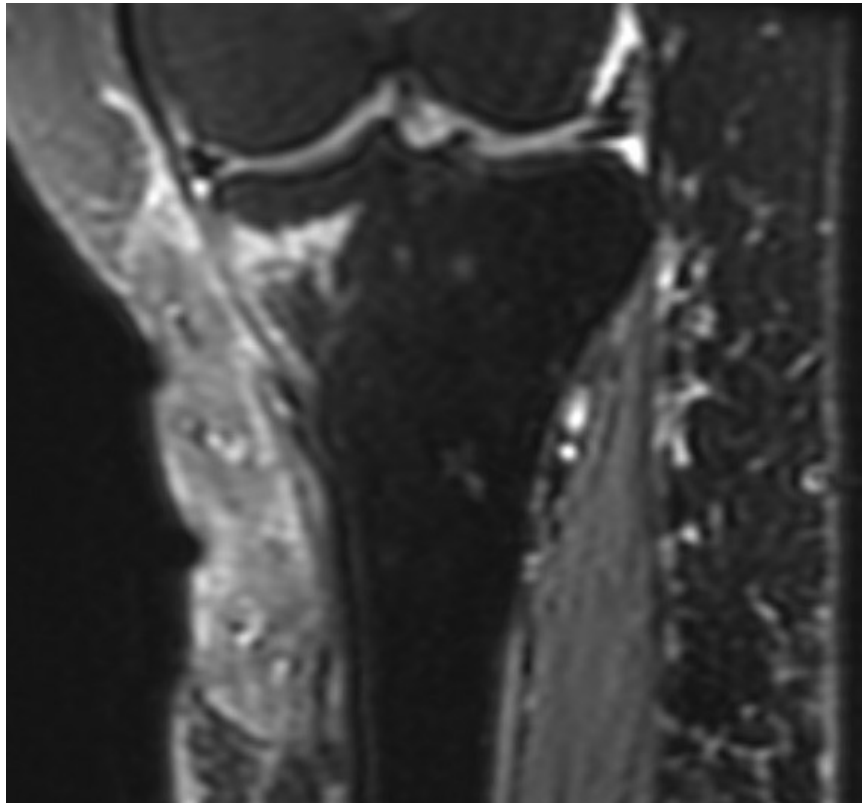
Percutaneous Cementoplasty: Long bones

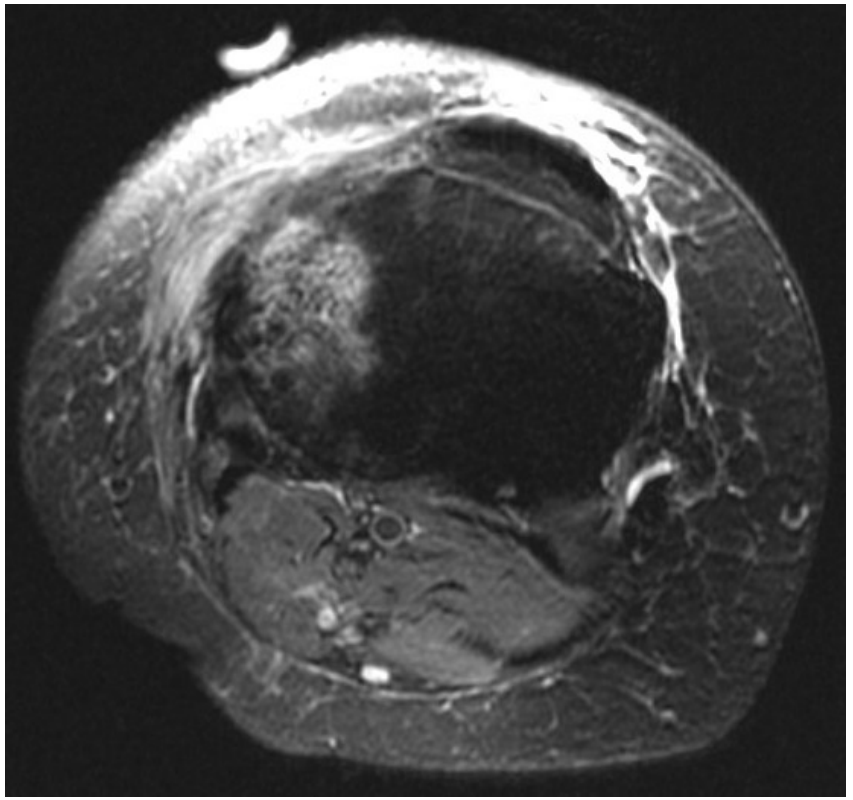
- PMMA is considered resistant to compressive forces but less to torsional forces
- Torsional forces are common in long bones
- Review: 223 lesions (64% femur, 17% humerus and 10% tibia. 50% of the lesions were epiphyseal and 44% metaphyseal
- Percutaneous stabilization in 17% of the patients
- Post-procedural VAS: 68% significant improvement and 27 % mild improvement
- Complications: fractures 8%, hematoma and symptomatic cement leakage 2%.
- Patients not suitable for surg due to comorbidities/advanced stage of disease
- Little to no biomechanical validation supports this approach

Cazzato RL et al. Percutaneous long bone cementoplasty for palliation of malignant lesions of the limbs: A systematic review. CVIR 2015

Percutaneous Cementoplasty: Long bones

56 yo female with Hx of pleomorphic sarcoma of left knee s/p resection followed by radiation treatment. Pat developed L knee mechanical pain particularly with ambulation. VAS 7/10





MRI Oct 2020: Insufficiency fracture of the medial plateau of left tibia secondary to RT.

Percutaneous Cementoplasty: Long bones

Bone augmentation with cavity creation: 4.5 mL of cement

X Ray 10 months after cementoplasty

Follow-up visit 10 months after IR-guided cementoplasty to the medial left tibial plateau: No mechanical pain. Hyperesthesia and left knee discomfort likely due to RT. Patient to remain as active as tolerated