

Osteomyelitis of the Femur Effectively Treated with Medulloscopy: a Case Report



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Medulloscopy

The term medulloscopy was coined by Roberts et al. who used a standard arthroscopic technique to treat infectious intramedullary lesions. It refers to the visualization of the intramedullary canal with an arthroscope, providing access to the infection site without the need for an extensive approach therefore not compromising the surrounding soft tissue. Additionally, it provides information regarding the extent of the infected endosteal surface of bone and it allows a thorough debridement of the intramedullary canal in a controlled manner. This is not possible with any other technique that is used for debridement of the intramedullary canal such as intramedullary reaming that is performed without direct visualization.

Roberts CS, Walker JA, Statton J, Seligson D (2001) Medulloscopy for sepsis or nonunion: Early clinical experience with the tibia and femur. *Arthroscopy* 17:E39.



Figure 1A-B. (A) Lateral radiograph of the distal femur, (B) lateral radiographs of the knee show bone sclerosis and sequestration and cystic lesions of the medial and lateral condyles.

Case Report

A 64 year old man had a supracondylar fracture of his right femur that was treated with open reduction and internal fixation with plate and screws 5 years before his presentation to our hospital. Clinical examination showed swelling and increased temperature at the supracondylar area of the right femur, as well as a discharging sinus at the lateral side of the distal femur. Radiographs showed a round osteolytic lesion involving the subchondral area of the medial and the lateral condyle. After multiple failed open surgical procedures at another institution and due to the severity of the bone defect, surgical debridement using Medulloscopy was decided. On the third postoperative month the patient developed fever and pain with swelling at the operated site, so that a second operation was performed. Four months later, void of clinical and biochemical signs of infection, the final stage of the procedure took place. The wound and the osseous defects at distal femoral metaphysis were washed and debrided arthroscopically once more and were filled up with osseous graft through the cortical window. At the last follow-up, 2 years later, the patient presented without any evidence of recurrent infection pain-free and able to undertake his usual daily activities without restrictions.

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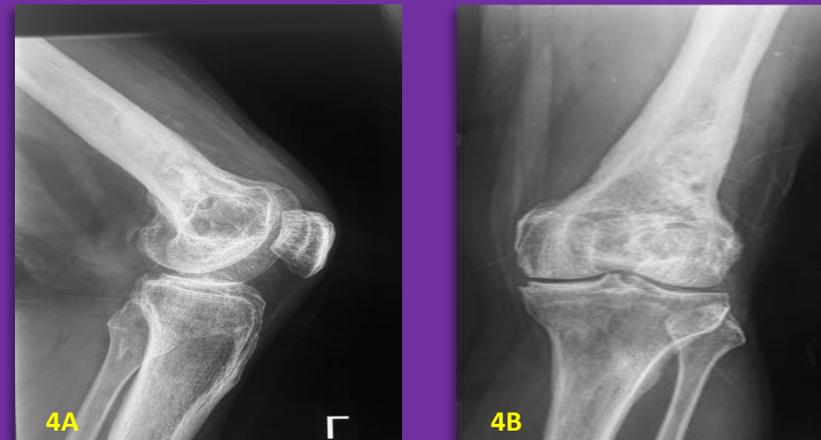
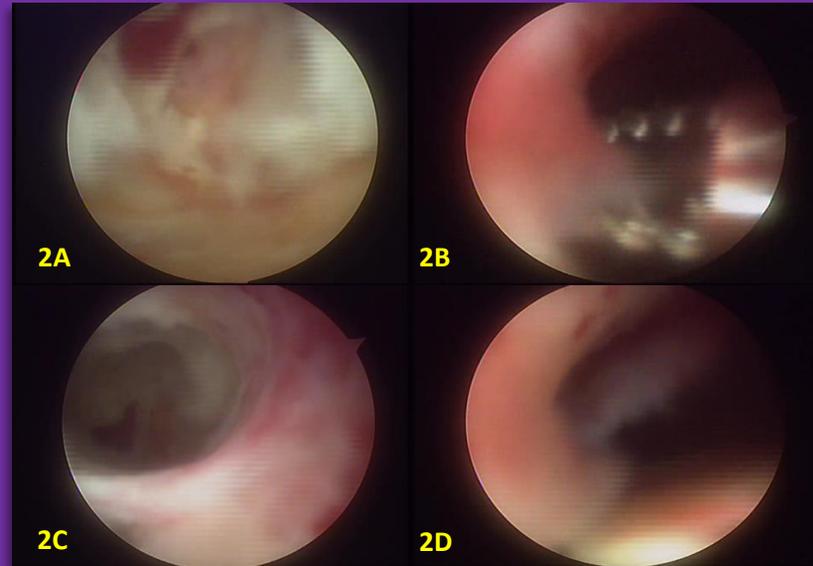
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Technique

With the patient in the supine position under spinal anesthesia, the sinus tract was excised down to the cortex of the femur. A cortical window, measuring 20mm x 15mm was formed around the sinus origin with an osteotome. Then, a 5mm arthroscope was directed caudally and the intramedullary canal was thoroughly irrigated. Following the irrigation, all the macroscopically visible inflammatory tissues were excised with the use of a 3.5 mm shaver and burr. Due to the limited length of the arthroscope, in order to reach the proximal femur, an intramedullary reamer was used which reamed up to a diameter of 11mm. Lastly, beads made out of acrylic bone cement mixed with antibiotics were inserted, and the cortical window was sealed using the same cement.

Figure 2A-D. Intraoperative medulloscopy images show (A) the sequestral cystic lesion of the medial femoral condyle with evident necrotic osseous endosperm tissue and biofilm presence, (B) debridement of the cystic lesion with the 3.5mm arthroscopic shaver, (C) the cystic lesion after debridement of the endosteum and the infectious biofilm, and (D) the sequestral cystic lesion of the lateral femoral condyle after debridement.



Discussion

The conventional treatment of chronic osteomyelitis involves extensive bone debridement, which can disturb the periosteal circulation and damage the surrounding soft tissues. On the other hand, Medulloscopy is a more delicate procedure, where soft tissues are preserved with minimal injury. Unfortunately, there are some drawbacks with this method. Firstly, Medulloscopy is limited to lesions of the intramedullary canal and of the osteochondral bone region. Moreover, the conventional arthroscope is rigid and shorter than a typical femoral diaphysis. Further development of flexible and longer arthroscopes is required to enhance this method. More studies, which take these variables into account, will need to be undertaken.

Figure 4A-B. (A) Anteroposterior and (B) lateral radiographs of the distal femur and knee show consolidation of the cystic lesions.