Elbow osteonecrosis in sickle cells anemia: A study of six cases

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Summary A series of six elbows with aseptic osteonecrotic lesions is reported in a population of sickle cell anemic patients. Pain and range of motion limitation were the most commonly observed symptoms during the course of the disease. Three of these elbows had to undergo a surgical procedure (core decompression or loose body excision).

Introduction Osteonecrosis of the elbow in children has been reported several times in the orthopedic literature [1–5]. Osteonecrosis of the capitulum was described for the first time in 1929 by Panner [6]. Since then, many publications have mentioned osteonecrosis of the elbow in children and adolescents, either secondary to injury or with onset unrelated to injury. To our knowledge, there have been no reports on osteonecrosis of the elbow in adults with sickle cell anemia, and only two publications have reported onset of osteonecrosis on the elbow in an adult [7,8]. This study reports the onset of osteonecrosis of the elbow in four sickle cell anemia patients.

Clinical cases Between 1985 and 2005, more than 1000 patients were treated at the Henri-Mondor hospital for adult nontraumatic osteonecrosis in sickle cell anemia patients whose genotype was SS, SC or S for β-thalassemia. Of these patients, four were identified as having osteonecrosis of the elbow (bilateral in two cases). None of these patients had a history of injury to the elbow or a childhood disease that could have involved the elbow. However, all four patients had multifocal osteonecrosis, involving other joints than the contralateral elbow (hips, shoulders, knees). The four patients’ genotype was SS.

Three patients were female. The mean age was 25 years (range, 20–30 years). Osteonecrosis of the elbow was diagnosed in one case after surgery on the hip (also for osteonecrosis) and the use of crutches. In two cases, the clinical diagnosis was reached because of the appearance of pain during sickle cell anemia flare-ups. In this case, the diagnosis was made based on hyperfixation of contrast on bone scintigraphy in a patient presenting multifocal...
Osteonecrosis. At the beginning stage, the clinical examination was limited to lateral pain when palpating the elbow and pain when mobilizing the elbow in flexion and extension and in pronosupination.

The x-rays contributed little to the diagnosis. The association of elbow pain and the context of multifocal osteonecrosis suggested this diagnosis and it was confirmed by CT and MRI, with these two tests more clearly demonstrating osteonecrosis of the elbow than the x-rays requested beforehand.

The elbow lesions were bilateral in two patients and unilateral in two patients. All six elbows showed capitulum involvement, the most frequent location. Two elbows had multifocal involvement (Fig. 1) reaching the capitulum, the epicondyle, the trochlea, and the radial head. The other elbows had isolated necrosis of the capitulum or necrosis of the capitulum associated only with trochlear involvement.

**Progression and treatment**

The elbow pain was sufficiently invalidating in two patients, who suffered from nighttime pain, to require surgery involving percutaneous core depression of the external epicondyle using a 3-mm trephine, which successfully halted the pain. The clinical manifestations other than pain were limited range of movement, particularly extension range of movement, with all patients retaining pronosupination and flexion function. One of the patients had to be operated on for loss of extension range of movement. The radiographic assessment showed humeroulnar osteophytosis associated with foreign bodies in the joint space. On the standard x-rays, joint space narrowing was not visible, undoubtedly because of a phenomenon of pseudowidening of the joint space related to the foreign bodies within the joint. On the other hand, CT arthrograms clearly showed the foreign bodies, the osteophytosis, but also the disappearance of joint cartilage on many surfaces. Surgery via the posterior approach removed the osteophytosis from the top of the olecranon, removed a foreign body from the posterior portion of the joint, and removed a number of foreign bodies in the anterior portion of the elbow by boring the olecranon fossa, which gave access to an anterior approach to the elbow.

One of the patients had simple arthroscopic removal of foreign bodies, since the elbow had locked several times, without the x-rays demonstrating osteophytosis or osteoarthritis.

**Discussion**

Nontraumatic osteonecrosis of the elbow in adults is a rare entity. Its diagnosis is currently facilitated by the use of CT or MRI on painful elbows in patients in whom osteonecrosis is suspected. The onset of the disease does not seem isolated in that two other publications [7,8] also report adult osteonecrosis of the elbow beginning only in patients who had taken corticosteroids and who had osteonecrosis present in other joints. It has never been reported in adult sickle cell anemia patients.

From a physiopathological point of view, the frequency of capitulum involvement on the elbow can be compared to this location in children. This may be related to the intra- and extraosseous vascularization of the elbow, as has been described previously [9—11]: the capitulum is vascularized only from posterior arteries, whereas the other anatomical structures of the elbow are vascularized from both anterior and posterior arteries. The central part of the trochlea is a zone that is relatively poorly vascularized, which may also explain the trochlear locations of adult osteonecroses.

Depending on the magnitude of the functional signs and the radiological results (foreign body, osteophytosis, osteoarthritis), the treatment can vary from simple infiltrations, to a boring procedure, simple arthroscopic removal of the foreign body [12], and finally to open surgical removal of the osteophyte or the foreign body. To date, no prosthesis for nontraumatic osteonecrosis of the adult elbow seems to have been reported in the literature.

**References**


