

Is Kaplan's Approach Better Than Kocher's Approach in Septic Arthritis of the Elbow? - A Unique Case Report

Sheshagiri V¹, Dr Vidya CS², Madhan Kumar K³

¹Associate Professor - Department of Orthopedics, JSS Medical College, JSS AHER Mysuru

²Professor and Head of Anatomy - JSS Medical College, JSS AHER, SS Nagar, Mysore

³Postgraduate Student - Department of Orthopedics, JSS Medical College, JSS AHER, Mysuru

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ABSTRACT

Introduction: septic arthritis of the elbow is a rare clinical entity, and its occurrence in a seropositive inflammatory joint disease like Rheumatoid Arthritis is even more unusual. However, it is a devastating surgical emergency that can result in irreversible joint destruction, functional limitations, and significant mortality.

Each rheumatoid arthritis case presenting with a flare-up joint should be assessed individually to rule out septic arthritis of the joint. Arthrotomy and lavage of the joint through Kaplan's approach can be considered as an alternate to Kocher's approach in terms of greater visibility of the joint cavity, easy approach, no risk of injury to the lateral ulnar collateral ligament (LUCL) and limiting the chances of posterolateral rotatory instability (PLRI) of the elbow.

Keywords: Kaplan's approach; Kocher's approach; Lateral ulnar collateral ligament; Septic arthritis; Rheumatoid arthritis.

Introduction

Elbow septic arthritis is a devastating surgical emergency that, even with prompt treatment, can lead to irreversible joint destruction and has a mortality rate of around 10%¹.

Septic arthritis of the elbow is a rare clinical entity, and its occurrence in a seropositive joint disease such as Rheumatoid Arthritis is even more unusual.

The risk of Septic Arthritis in a rheumatoid patient, irrespective of treatment, is increased by 4–15-fold².

The diagnosis of septic arthritis of the elbow in a rheumatoid arthritis patient can be difficult because the development of a warm painful joint is often confused with a flare up of the underlying joint disease, causing a delay in diagnosis of septic arthritis.

There is a lacuna in the literature regarding which open lateral approach to opt for in order to explore the elbow joint without disturbing the anatomy significantly, the Kocher's or the Kaplan approach. Both approaches have their pros and cons, which makes decision making difficult.

The goal of treatment is to obtain local eradication of infection by arthrotomy or arthroscopic lavage and to restore elbow functionality without untoward sequelae.

There is very limited literature available on the topic of septic arthritis of the elbow joint in patients with rheumatoid arthritis and no studies on which open surgical approach to implement during arthrotomy and lavage of the elbow.

This paper reports a case of septic arthritis of the elbow in a 21-year-old female with rheumatoid arthritis treated by arthrotomy and lavage by the Kaplan Approach.

Case Report

A 21-year-old female homemaker presented to our JSS outpatient department with acute right elbow pain for 2 days, associated with swelling and restriction of elbow movements. The patient gave a history of high-grade fever for 2 days. There was no history of trauma. Her medical history revealed she was a known case of Rheumatoid Arthritis, diagnosed 6 months ago and was on regular DMARD's. The patient also gave a history of pain and swelling in the right knee 15 days ago, for which knee tapping was done and the patient improved symptomatically. Following this acute flare up of underlying disease, she was started on Tab. Methylprednisolone 4 mg/day and Tab. Methotrexate was stepped up from 10mg to 20mg. She initially consulted her rheumatologist, acknowledging as a relapse of the underlying joint disease, the elbow joint was aspirated, which showed Frank pus. Empirical antibiotics were started and she was referred to us. Physical examination revealed swelling in the Anconeus triangle, redness, and a local rise in temperature around the right elbow that was tender on palpation with flexion deformity of 30 degrees (fig 1).

Laboratory studies demonstrated a total leucocyte count (TLC) of 13710/mm³ with 80% of neutrophils

and elevated inflammatory markers such as C-reactive protein (CRP) of 126mg/L and ESR of 120 mm/hr. An X-ray showed swelling of the soft tissues around the elbow joint. USG Surface scan of the right elbow revealed moderate joint effusion with fine mobile internal echoes and evidence of synovial thickening findings, which correlated clinically with the diagnosis of septic arthritis. Functional limitation, pain, swelling, articular effusion, elevated peripheral leukocyte count, ESR and CRP, were supportive to the diagnosis of septic arthritis of elbow and the decision for emergency arthrotomy and lavage was taken. Patient was counselled regarding the need of surgery, complications associated, chance of recurrence prior to surgery and after taking written surgical consent, surgery was performed.

The patient was placed in a supine position on the operating table with the arm on an arm board and the elbow at 90° of flexion and the forearm in pronation. The elbow was approached by KAPLAN's approach through a 4 cm longitudinal incision from the tip of the lateral epicondyle distally towards the Lister's tubercle (fig 3). A plane between the ECRL and EDC was made. At the deep level, the capsule was incised to expose the joint and around 20 ml of pus was evacuated out. The joint was irrigated with 3 litres of saline. The capsule was left open after copious lavage. A drain was placed and wound was closed loosely in one layer with Ethilon suture, vicryl was avoided. An Arm Pouch was applied to support the elbow. Intra-operative culture of the pus reported no growth after 48 hours. She continued to receive intravenous antibiotics Cefuroxime (750mg) + Sulbactam (375mg) twice daily for 1 week, followed by oral antibiotics for 4 weeks.

Post-operatively, the drain was removed on Day 2 and range of motion exercises were started. At post-operative Day-12, sutures were removed and she had full range of motion in her elbow with no sign of complications.



Figure 1. Pre-op image of elbow in flexion deformity.



Figure 2. X-ray of right elbow showing soft tissue oedema around the joint.



Figure 3. Skin incision markings of Kaplan's (KAP) and Kocher's (KOC) approach.



Figure 4. Range of motion and functional outcome.

Discussion

The case highlights the diagnosis and decision-making in the management of a septic inflammatory disease elbow and the choice of the probable best approach for draining a septic arthritis elbow without damaging the lateral ulnar collateral ligament (and limiting the risk of late PLRI, which presents as posterior subluxation or dislocation of the radial head).

The immune dysfunction in RA has an increased susceptibility to bacterial joint colonisation and infection. The treatment of RA with corticosteroids, methotrexate, DMARD's and other biological therapies may decrease the immune function further, which is required for defence against infectious agents. As a result, immunosuppressive medication use in rheumatoid arthritis patients can be suggested as a cause of septic arthritis³.

The diagnosis of septic arthritis of the elbow in a rheumatoid arthritis patient can be difficult because the development of a warm painful joint is often confused with a flare up of the underlying joint disease, causing a delay in diagnosis of septic arthritis, which can lead to irreversible joint destruction, sepsis, osteomyelitis, persistent pain, and limitation of motion of the elbow. As a result, it is critical to rule out superimposed septic arthritis in any rheumatoid arthritis patient who presents with a hot, painful joint.

Although arthroscopic drainage and lavage is a reasonable alternative to open treatment, considering the low socioeconomic profile and financial constraints of our patient, open treatment was chosen⁴.

Arthrotomy of the elbow may result in PRLI, because surgical approaches to the lateral elbow may damage the lateral ulnar collateral ligament (LUCL)⁵.

The Kocher and the Kaplan approaches are the two most common approaches used for gaining access to the lateral elbow. The Kocher approach centre's on the posterolateral elbow and utilizes the oblique interval between the anconeus and the extensor carpi ulnaris (ECU) (fig 4). The Kocher approach involves incision of the LUCL to gain access to the radial head and elbow joint cavity. The Kaplan approach starts more anterior to the Kocher interval, between the extensor digitorum communis (EDC) and the extensor carpi radialis longus

and brevis (ECRL & ECRB) (fig 5). The Kaplan approach affords greater visibility and scores over the Kocher's in terms of not damaging the lateral ulnar collateral ligament and causing late recurrent instability of elbow joint (posterolateral rotatory instability)^{6,7}.

The posterior interosseous nerve (PIN) lies in the proximity of the Kaplan's approach, indicating a risk of PIN palsy. This can be avoided by performing the approach with the forearm in pronation (fig 6), which shifts the nerve anteriorly and thereby widens the zone of safety. The posterior interosseous nerve translates around 1 cm medially on pronation of the forearm⁸.

In our case, culture of the intra-operative evacuated pus showed no growth, which could be due to the fact that empiric antibiotics were started prior to surgery. So it is crucial that the pre-operative aspirated pus from the joint be sent for cell count, gram staining, and culture before antibiotics are started, or else accurate pathogen identification becomes challenging.

Lastly, the repair of wounds in septic cases need not be in layers as it carries the risk of vicryl infection. Vicryl, as a braided polyfilament suture, has a high rate of infection and reaction, which can be detrimental in septic wound healing⁹.

Conclusion

Septic arthritis of elbow being a rare condition, superimposed with Rheumatoid arthritis provokes difficult issue to diagnose, treat and prevent functional limitation. Open arthrotomy and drainage is a better alternative to arthroscopic drainage in low socioeconomic condition of the patient. Kaplan's approach is preferred over Kocher's approach in septic elbow open arthrotomy in terms of greater visibility of the joint cavity, easy approach, PIN injury can be prevented by forearm pronation, has no risk of injury to the lateral ulnar collateral ligament (LUCL) and henceforth limiting the chances of posterolateral rotatory instability (PLRI) of the elbow.

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Corresponding author
Vidya C S
E-mail: vidyacs@jssuni.edu.in