

Case Study

SYNOVIAL CHONDROMATOSIS OF THE RIGHT ELBOW: A CASE STUDY AND LITERATURE REVIEW

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ABSTRACT

A joint disorder called synovial chondromatosis is characterised by aberrant cartilage development in the synovial membrane. We present the case of a 65-year-old female patient who presented with the chief complaint of right elbow swelling. Upon MRI evaluation, the right elbow showed mild to moderate elbow joint swelling, a superior radioulnar joint effusion, and a mass over the posterolateral aspect. Laboratory findings indicated abnormalities in haematological and biochemistry lab values. The patient was diagnosed with right elbow synovial chondromatosis and treated with IV fluids, antibiotics, proton pump inhibitors, analgesics, and other supportive medications. Without treatment, cartilage lesions in the synovium can develop, leading to severe joint injury, discomfort, and incapacity. The illness itself is rarely life-threatening; however, in extremely rare instances, problems, including chronic arthritis or joint distortion may arise. Therefore, the patient has to be closely watched and treated as soon as possible to prevent more complications in the future. In this study, we present the definitions, aetiology, epidemiology, pathogenesis, signs and symptoms, risk factors, and complications of the above-mentioned disease to create awareness of the disease following a case report that was presented.

Keywords: Synovial chondromatosis, Right elbow, Loose entities, Cartilaginous nodules, Lesions

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INTRODUCTION

The thin film of tissue that surrounds the joints, the synovium, is affected by an uncommon, benign (or noncancerous) disorder known as synovial chondromatosis (also known as synovial osteochondromatosis). Though it can develop in any joint in the human body, synovial chondromatosis most frequently affects the knee [1]. Locally invasive cartilaginous tissue bone tumours called synovial chondromatosis. It is composed of many hyaline cartilage-like nodules and may develop into malignancy [2]. It is unclear what the precise underlying aetiology of synovial chondromatosis is. Since it mostly manifests in weight-bearing joints, some evidence points to trauma as a potential contributing factor in its development. Another important element that has been suggested is infection. It is not inherited [3]. It has been observed that there are two types of synovial chondromatosis: primary and secondary. The more uncommon primary synovial chondromatosis develops on its own and doesn't seem to be related to any underlying medical issues. The more prevalent type, secondary synovial chondromatosis, frequently arises in patients who already have osteoarthritis, rheumatoid arthritis, osteonecrosis, osteochondritis dissecans, neuropathic osteoarthropathy (which frequently affects diabetics), tuberculosis, or osteochondral fractures (broken cartilage wrapping the end of a bone in a joint) [4]. According to estimates, synovial chondromatosis affects 1 in 100,000 persons annually, making it a rare condition [5].

The illness was thought to be caused by loose entities in the joint segment that lacked the ability to proliferate on their own. Through the expression of CD90 and cluster of differentiation 105 (CD105), the synovial membrane may be linked to the development of loose bodies [6]. Furthermore, related research has shown that Transforming Growth Factor Beta 3 (TGF-β3) or Fibroblast Growth Factor 2 (FGF-2) are implicated in the pathophysiology of synovial chondromatosis and are in charge of the development of cartilaginous loose bodies [7].

People typically complain of joint discomfort that lasts for months or even years, doesn't go away with exercise, steroid injections, or heat therapy, doesn't show up on an X-ray, but clearly limits their range of motion. This illness is divided into three distinct stages: Stage I is minimal and includes aggressive synovial illness but without loose cells; Stage II is a transition and includes loose masses and aggressive synovial

illness; Stage III is advanced and includes loose entities but without synovial illness [8]. MRIs, CT scans, and X-rays are used in medical imaging to make the diagnosis. Cone Beam Computed Tomography (CBCT) may additionally be helpful for diagnosis [9]. Non-steroidal Anti-Inflammatory Medications (NSAIDs) can be used to treat stage I pain. Removal of the loose bodies or the defective synovial membrane is usually advised for stages II and III. The surgeon chooses between open and arthroscopic surgical resection based on the situation [10].

Brief summary about the case

A 65-year-old female patient presented with the chief complaint of right elbow swelling. Upon MRI evaluation, the right elbow showed mild to moderate elbow joint swelling, a superior radioulnar joint effusion, and a mass over the posterolateral aspect. After underblock right elbow chondromatosis, the excision was done. The post-op period was uneventful. During her hospital stay, she was treated with IV fluids, antibiotics, proton pump inhibitors, analgesics, and other supportive medications. The patient was stable and being discharged on medication advice.

CASE STUDY

Source of the data

The following case study was gathered from the tertiary care multispecialty hospital at Vijayawada and approval No-PD012/IRB/NRML/24-25.

Patient chief complaints

A 65 y old female patient was admitted with the chief complaints of right elbow swelling.

Diagnostic methods

MRI study of right elbow joint

- Mild to moderate elbow joint superior radio ulnar joints effusions, diffuse synovial thickening, paraarticular inflammatory cysts with rice grain loose bodies seen around elbow predominantly in posterolateral aspect with subtle cortical erosions around elbow, subchondral cysts – MR features in favour of rheumatoid arthritis or chronic infective tubercular arthritis.

- Focal grade-II strain with partial tear of common extensor tendons origin at lateral epicondyle of humerus under a background of calcific tendinosis and tennis elbow changes.
- Focal grade-I strain in common flexor tendons origins at medial epicondyle of humerus.
- Grade-II chondromalacia in rest of the compartments of elbow joint, grade-II-III chondromalacia in capitulum region.
- Biceps, triceps tendons insertions show mild tendinosis changes.

Real-time ultrasonography of the right elbow

- Well-defined lobulated exophytic lesion noted at posterolateral aspect of right elbow at distal of humerus measuring 3.2 * 2.2 CM with few calcifications with surrounding soft tissue component.
- There is underlying cortical destruction seen along the lateral condyle of humerus.

To rule out the possibility of osteosarcoma.

Table 1: Physical examination

S. No.	Vitals	Normal values	Observed values
1.	Blood pressure	120/80 mmhg	110/70 mmhg
2.	Pulse rate	60 – 100 bpm	81 bpm
3.	Respiratory rate	12–20 breaths/min	18/min
4.	SPO2	95 – 100 %	98%
5.	Temperature	97.8°F – 99.1° F	Normal

The patient's temperature was normal, her blood pressure was 110/70 mmHg, and her pulse and respiration rates were 81 and 18 beats per minute, respectively.

Table 2: Systemic examination

S. No.	Constituents	Observed
1.	CVS	S1 S2+
2.	RS	B/I AE+
3.	CNS	NFND
4.	P/A	Soft

CT scan of right elbow joint

- Marginal osteophytes noted at articular surfaces with subchondral sclerosis and and cysts noted at elbow joint.
- Ill-defined soft tissue density lesion with multiple fluffy calcific foci (arcs and rings calcification) is seen in posterior aspect of elbow

joint, causing scalloping and mild expansion of lateral epicondyle of humerus.

- Few hypodense areas noted within the lesion? Chondroid matrix. No evidence of periosteal reaction.
- Chondrosarcoma to be considered.

Table 3: Laboratory investigations

Laboratory parameters	Observed values	Normal values	Indication
Haematology			
Haemoglobin (Hb)	11.4 g/dl	12-15 g/dl	anaemia
Haematocrit (PCV)	33.3 %	34-48 %	anaemia
Biochemistry			
Glucose – Random	258 mg/dl	70-140 mg/dl	Higher
Serum creatinine	0.58 mg/dl	0.60-1.20 mg/dl	Lower
T3-triiodothyronine	0.767 ng/ml	0.800-2.180 ng/ml	Decrease

Table 4: Drug chart

S. No.	Brand name	Generic name	Dose	RoA	Frequency	Used in
1.	Tab. Olmesartan	Olmesartan	40 mg	PO	1-0-0	Hypertension.
2.	Tab. Metasens Vg2	Glimepiride, Metformin, Voglibose	2/0.2/500	PO	1-0-1	diabetes mellitus
3.	Inj. Supacef	Cefuroxime	1.5 gm	IV	1-0-1	Infections in joints
4.	Inj. Tramadol	Tramadol	50 mg	IV	SOS	Pain
5.	Inj. Pan	Pantoprazole	40 mg	IV	1-0-0	GERD.

The study included patients above 50 years of age who did not have any co-morbidities such as hypertension or diabetes. Individuals who were under 50 y old, as well as those diagnosed with hypertension or diabetes, were excluded from the study.

DISCUSSION

Elbow synovial chondromatosis is the development of cartilaginous lesions in the elbow joint's synovial layer. The ailment may affect the soft tissues surrounding the joint as well as the joint itself; loose bodies frequently cause irritation or mechanical discomfort in the afflicted joint [11]. The prevalence of synovial chondromatosis is thought to be 1 in 100,000 people each year, making it an

uncommon disorder. Large joints like the shoulder, hip regions, and knee regions are the most commonly affected, while the elbow joint may also be affected. A male-to-female ratio of around 2:1 indicates that male patients are more frequently impacted than female ones. The precise cause of synovial chondrosis is uncertain since it has a predominantly idiopathic origin. But secondary causes like joint trauma, chronic inflammation (like rheumatoid arthritis), or hereditary disorders like Hereditary Multiple Exostosis (HME) may also be linked to it [12].

The illness occurs in three stages. There are no loose bodies in the early stages of active synovitis. Loose bodies and remission of synovitis are indicative of phase three, whereas nodular synovitis and loose bodies are indicative of phase two [13]. The illness was at stage two for the present patient. In this condition, patients have decreased Hb and haematocrit levels and decreased serum creatinine and T3 levels. The pathogenesis of synovial chondromatosis includes the metaplastic conversion of synovial tissue cells into chondrocytes, which results in the development of loose entities and cartilaginous lesions inside the joint [14]. Joint discomfort, stiffness, oedema, and physiological symptoms like freezing or clutching are all indicators of synovial chondrosarcoma [15]. Age (30–50 y), male sex, hip trauma, underlying joint illnesses (e. g., rheumatoid arthritis), and genetic disorders such as Hereditary Multiple Exostosis (HME) are risk factors. Imaging methods such as X-rays, MRIs, or arthroscopies that reveal loose masses and cartilage lesions are used to confirm the confirmation of synovial chondromatosis [16]. In order to eliminate loose entities, treatment usually consists of an open or arthroscopic synovectomy and post-operative therapy. Chronic pain, infection, joint degeneration, and lesion recurrence are among the complications [17].

CONCLUSION

This case report describes a 65-year-old female patient who presented with the chief complaint of right elbow swelling. The patient was diagnosed with right elbow synovial chondromatosis. Laboratory findings indicated abnormalities in haemoglobin, haematocrit, serum creatinine, T3, and random blood glucose levels. This condition was identified through MRI imaging, CT, and USG of the right elbow, and successful excision of the chondromatosis mass was performed. Post-operative recovery was smooth, and the patient was advised on lifestyle changes to preserve joint mobility, including avoiding stress on the joint and engaging in low-impact exercises. Although synovial chondromatosis is rarely life-threatening, untreated cases can lead to significant joint damage, pain, and disability. Regular monitoring and early intervention are crucial to prevent complications and ensure long-term joint health and function.

LIMITATIONS OF THE STUDY

The results of this case report on synovial chondromatosis in a 65 y old female patient may not be applicable to other individuals or populations, which limits its generalisability. applied to female patients over the age of fifty.

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ETHICAL STATEMENTS

Although an attempt was made to get the patient's consent, the patient was not reachable. To protect the privacy of the patient, no identifying information has been supplied.

AUTHORS CONTRIBUTIONS

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CONFLICT OF INTERESTS

The authors affirm that they have no conflicts of interest.

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