

# Case Report: Chronic Olecranon Bursitis as a Risk Factor for Squamous Cell Carcinoma

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## Learning Point of the Article:

Chronic wounds and inflammatory conditions can predispose patients to developing squamous cell carcinoma, necessitating proper treatment and follow-up to mitigate this risk.

## Abstract

**Introduction:** Chronic inflammatory conditions have previously been shown to lead to the development of cancer in humans. Olecranon bursitis (OB) has not yet been explicitly correlated to the development of squamous cell carcinoma and to our knowledge, this is the first case report documenting this possible association.

**Case Report:** A 70-year-old male with a 12-year history of non-healing wounds, smoking, alcohol use, gout, and intermittent OB presented to the orthopedic clinic with acutely worsening left elbow pain, fever, chills, and fatigue. He was previously treated with incision and drainage (I&D) on numerous occasions during his 12-year disease course with instructions to follow-up with wound care and control risk factors, but was non-compliant. In June 2025 the patient acutely presented with progression of his wound to a large pyogenic ulcer with deep extension and systemic symptoms. At that time he underwent I&D with tissue biopsy, revealing that his wound had developed into squamous cell carcinoma (SCC). Following this diagnosis, the treatment plan shifted from radical excision with flap coverage to upper extremity amputation as a life-preserving measure.

**Conclusion:** This case demonstrates the morbidity associated with a chronic inflammatory state coupled with patient non-compliance. This highlights the importance of early intervention and compliance in the treatment of chronic inflammatory conditions, such that proper resolution is achieved in the acute setting, as well as to decrease the risk of complications of chronic disease such as SCC.

**Keywords:** Olecranon bursitis, squamous cell carcinoma, infection, inflammation, non-compliance.

## Introduction

Olecranon bursitis (OB) is an inflammatory condition of the olecranon bursa and one of the most common types of bursitis. OB is characterized by excess accumulation of fluid in the bursa, often resulting in swelling, erythema, tenderness, and reduced elbow range of motion [1].

OB can arise from infectious and non-infectious etiologies, which result in an inflammatory or immunosuppressed state.

The indications of treatment for OB are dependent on cause, generally beginning with medical therapy and escalating to invasive treatment for medication-resistant or recurrent cases [2]. Although chronic and recurrent OB has not been explicitly correlated with squamous cell carcinoma (SCC), chronic inflammation has been correlated with the development of SCC [3].

To the best of our knowledge, this case report is the first reported

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**Figure 1:** Evolution of left chronic olecranon bursitis observed through radiographic imaging. [A] Soft tissue swelling posterior to the olecranon process. [B] Thickened periosteum of the proximal ulna, but negative for mass. [C] Remodeling of the olecranon process with sclerosis. [D] Large soft tissue ulceration and presumed infection of the olecranon, suggestive of infection of the olecranon at deep margin of the ulcer.

instance of SCC arising from untreated chronic OB.

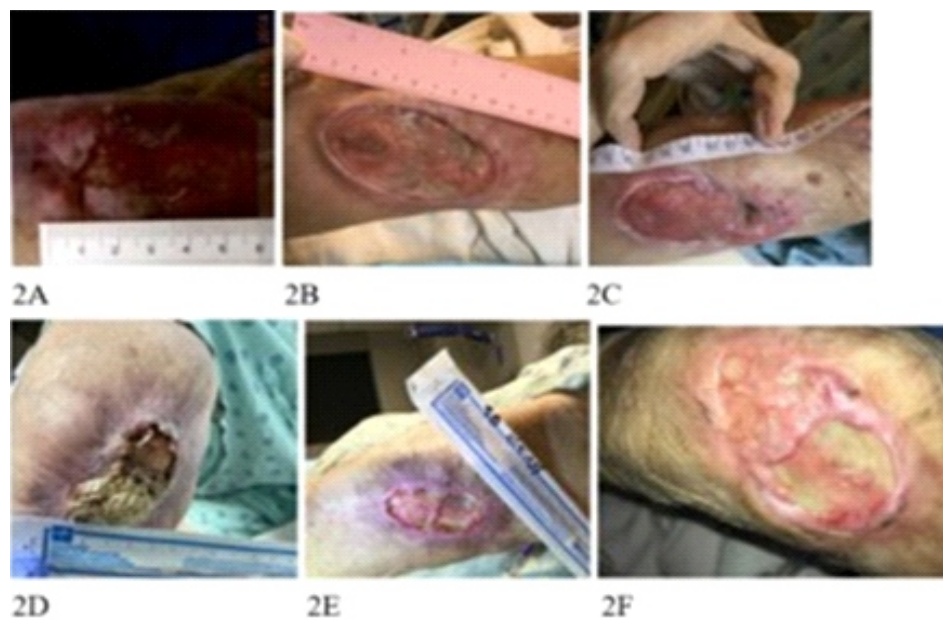
### Case Report

A 70-year-old male with previous medical history of smoking, alcohol abuse, atrial fibrillation, chronic kidney disease, gout, and recurrent left elbow osteomyelitis presented to the orthopedic clinic in June 2025 with complaints of fatigue, fever, chills, and acutely worsening pain of a chronic left elbow wound that has been present for over 12 years. He initially presented to another physician in 2013 with an inflamed olecranon that was evaluated clinically and with X-rays diagnosed as complex gangrene, subsequently treated with excisional biopsy.

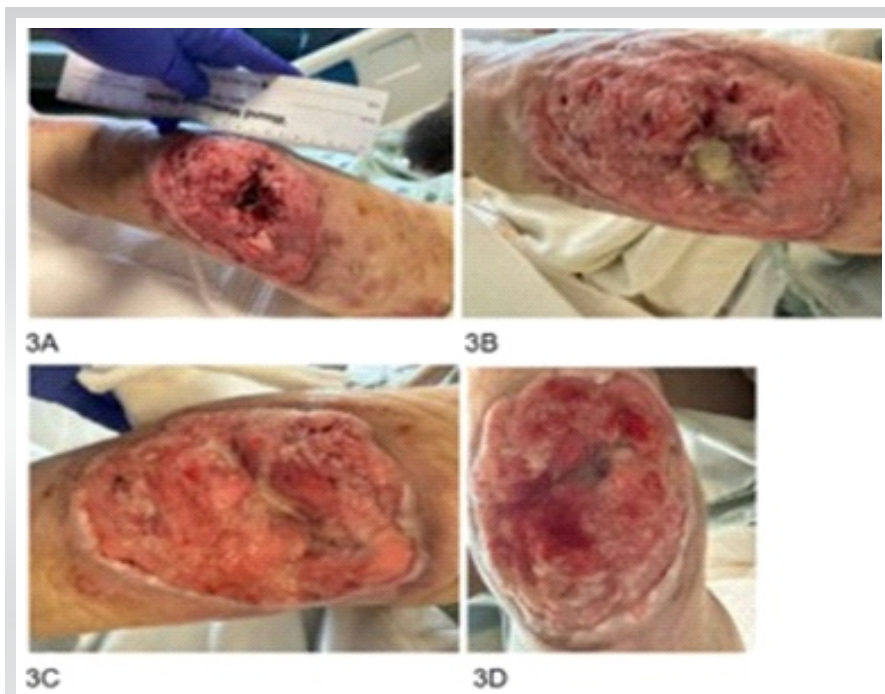
Tissue analysis at that time was negative for abnormal pathology and infection. The patient was encountered approximately every 6 months over the next 12 years with a similar presentation and treated similarly. On each occasion, he was discharged with instructions for proper wound care and a referral to wound care specialists. The evolution of his lesion has been documented through both X-ray and media uploads during this time (Figs. 1 and 2). During his disease progression, he failed to establish care with a wound care clinic and was non-compliant with disease management recommendations. Before his most recent presentation, he presented in 2022 and was diagnosed with chronic osteomyelitis and treated conservatively.

At the time of presentation in June

2025, the patient’s wound had progressed to a large pyogenic ulcer with deep extension (Fig. 3). Concern for osteomyelitis prompted evaluation with X-ray, computed tomography, and magnetic resonance imaging (Fig. 4). The wound was treated with incision and drainage (I&D) with tissue biopsy and culture. Before results of tissue biopsy were obtained the patient planned to consult a plastic surgery for a radical resection with flap. These diagnostic measures revealed that the chronic wound developed into SCC, likely due to chronic inflammation. At this time the patient was contacted with the diagnosis and surgery was planned to perform a transhumeral amputation with shoulder disarticulation as a life-saving intervention.



**Figure 2:** Evolution of left chronic olecranon bursitis observed through wound photography. (a) Shallow ulcer and erythema. (b) Shallow ulcer with smoother borders and purulence when compared to A. (c) Deeper extension when compared to previous images. (d) Deep extension and exophytic scabbing when compared to previous images. (e) Shallow ulcer with purulence and skin puckering. (f) More purulent when compared to E.



**Figure 3:** Clinical pictures of chronic wound at June 2025 presentation. (a) Large ulcer with deep extension. (b) Pyogenic filling of the ulcer.

Positron emission tomography scan in the interim was negative for metastasis; the patient is expected to proceed with the transhumeral amputation with shoulder disarticulation as a curative intervention.

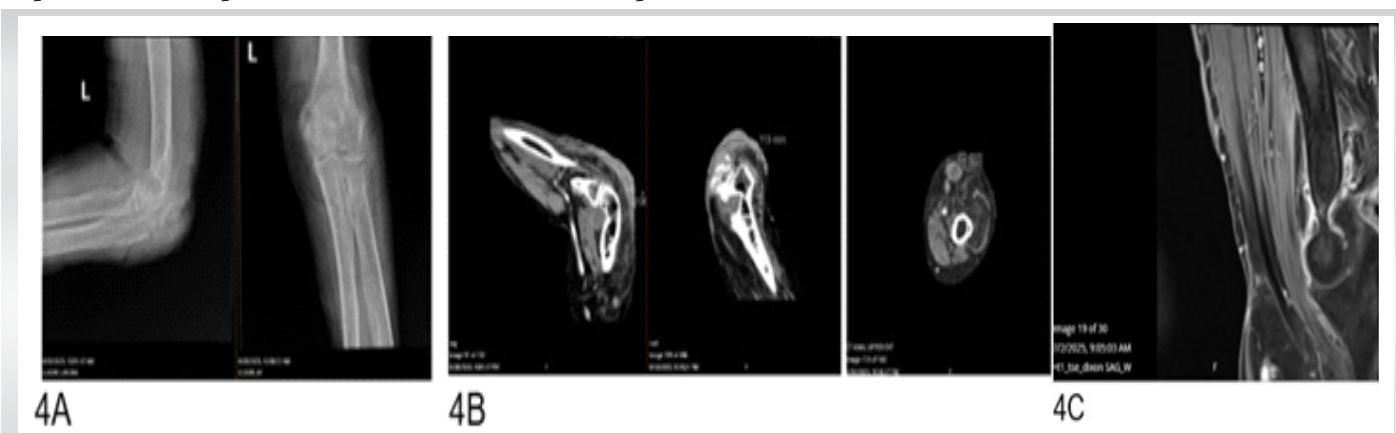
### Discussion

It is well known that chronic inflammation can often predispose patients to cancer, as is frequently observed in dentistry [4, 5, 6]. SCC carries a known association with chronic inflammation resulting from both infectious and non-infectious processes [7, 8]. To our knowledge, this is the first reported instance of chronic bursitis progressing to SCC. This case emphasizes the importance of adequate treatment and clinical follow-up to

ensure that diseases such as OB do not result in increased morbidity. In addition to chronic OB, this patient had multiple additional medical conditions that increase systemic inflammation, decrease wound healing, and decrease immune functions.

OB can be classified by cause, septic and aseptic, and acuity [9]. The predominant bacteria causing septic OB are *Staphylococcus Aureus* and *Beta Hemolytic Streptococcus* [1]. Septic OB often presents with cellulitis, warmth, skin lesions, and systemic symptoms when compared to aseptic OB, which commonly presents primarily as a tender swelling of the bursa without signs of skin irritation or systemic symptoms [9]. Chronic infection, as is present in chronic septic bursitis, is a known risk factor for the development of SCC [10]. Acute aseptic OB is most often a complication of trauma or extended pressure [9].

Accurate diagnosis of OB often involves bursa aspiration and Gram stain with culture to distinguish between septic and aseptic OB. This test is the gold standard due to low false positive rates but must be used in association with the clinical picture to achieve the most accurate diagnosis and guide treatment [1]. Non-surgical and surgical treatments can be considered for OB. While medical treatment is often initially preferred, treatment can require escalation to surgery. Aaron et al. report that most patients respond well to non-surgical management, such as ice, activity modification, and non-steroidal anti-inflammatory drugs [2]. Kaur et al.'s 2023 systematic review explains how conservative methods can be used to manage chronic aseptic OB if implemented earlier in the



**Figure 4:** Radiographic imaging of chronic wound at current presentation. [A] Soft tissue swelling, ulceration, and cortical erosion consistent with cellulitis and osteomyelitis. [B] 10 × 11 cm soft tissue thickening extending to the olecranon, concerning for neoplasm or scar tissue, as well as a partially necrotic medial brachial lymph node. [C] Soft tissue ulcer with lateral and deep extension concerning for osteomyelitis, as well as joint effusion, likely reactive synovial enhancement.

course of treatment. They further explained how corticosteroid injections are the most effective treatment for symptom control, but are not curative, and recommend they be used with caution due to a higher rate of complications, such as infection and skin atrophy [11]. OB presenting with fluctuance, systemic signs, and persistence despite conservative measures warrants escalation to aspiration and/or surgical I&D [1]. Bursectomy can be performed in patients with a history of recurrent bursitis or bursitis resistant to less invasive therapies [1].

Aseptic OB is frequently associated with immunosuppressive and pro-inflammatory conditions including, but not limited to, diabetes mellitus, gout, rheumatoid arthritis, and alcoholism, and impaired wound healing [1]. This association is not only related to the pro-inflammatory state associated with several of these diseases, but also with the immunosuppression therapies to treat diseases such as rheumatoid arthritis, inflammatory bowel disease, and vasculitis [1]. Among these conditions, this patient was an active smoker, has alcohol use disorder, has diabetes mellitus, and has a history of gout and chronic kidney disease.

Active smoking is a well-known vasoconstrictor, causing microvascular and macrovascular disease and impairing wound healing [12]. Alcohol is a risk factor for the development of cutaneous SCC in a dose-dependent manner and impairs wound healing, leading to persistence of wounds and decreased ability to fight infections. Alcohol consumption also results in increased oxidative stress, therefore creating an inflammatory state and worsening the body's ability to combat infections [13, 14]. Diabetes mellitus increases the risk for SCC in a multifactorial manner and has been associated with SCC in diabetics with chronic diabetic foot ulcers that progress to SCC [15]. Diabetes mellitus causes microvascular disease and neuropathy, impairing wound healing and reducing patient awareness of chronic wounds. In addition, uncontrolled diabetes mellitus increases inflammation directly through hyperglycemia and oxidative stress as well as secondarily through CKD [16, 17].

This patient has had CKD stage 3a/3b, determined by estimated glomerular filtration rate (eGFR), reported as late as 2013. Any documentation before 2013 is limited by the availability of information in the electronic medical records.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Recently, his eGFR categorizes him as CKD stage 4. CKD of any stage is associated with cancer development; Tang et al. conducted a registry-based study in Taiwan that specifically correlates patients with CKD on dialysis or post-transplant with the development of cutaneous SCC [18, 19]. This association can be multifactorial as dialysis can cause an inflammatory state, transplant can require immunosuppression, and CKD in general reduces wound healing [18, 19, 20]. Gout has also been associated with carcinogenesis and is a systemic inflammatory process due to hyperuricemia with local expression through arthritis. This patient's history of gout combined with alcohol use and CKD leads to a hyperuricemic state that can result in systemic inflammation and increase his risk for SCC [21].

This case emphasizes the importance of adequate treatment and clinical follow-up to ensure that diseases, such as OB do not result in increased morbidity. In addition to chronic OB, this patient had multiple additional medical conditions that increase systemic inflammation, decrease wound healing, and decrease immune function.

### Conclusion

To our knowledge, this is the first case to report of SCC arising from chronic OB. This case brings attention to several risk factors for the development of SCC and emphasizes the need for complete treatment of OB to prevent increased morbidity from chronic OB complications, such as SCC.

### Clinical Message

Squamous cell carcinoma is a rare consequence of chronic bursitis. Chronic bursitis should be adequately treated on initial presentation and followed clinically to prevent and/or monitor progression to SCC. Regular clinical follow-ups can decrease patient morbidity as earlier detection can permit less invasive and limb-saving treatments. Patients should be educated on the risk of their disease so that shared decision-making can be had to increase compliance and reduce the risk of SCC developing from the chronic persistence of an otherwise acute disease. In addition to patient education, healthcare providers should follow patients after acute treatment to ensure compliance, acute resolution, and chronic maintenance.



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