PAIN MEDICINE CASE REPORTS

ISSN 2768-5152

Volume 5, Number 6, pp. 301-304

Ultrasound-Guided Doxycycline Injection for Aseptic Olecranon Bursitis: Case Report

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Background: This case report describes the use of ultrasound-guided doxycycline injection as sclerotherapy for the treatment of aseptic olecranon bursitis.

Case Report: Our patient presented with a several-week history of posterior elbow swelling and tenderness. The clinical picture was consistent with aseptic olecranon bursitis. Ultrasonography was used to visualize posterior elbow structures and provide needle guidance to aspirate the fluid within the olecranon bursa and inject a sclerosant, doxycycline. The patient's recovery was uneventful, and the bursitis did not recur.

Conclusion: There are no other case reports describing ultrasound-guided injection of a sclerosant for treatment of aseptic olecranon bursitis. Doxycycline is an effective and safe sclerosant that can be considered for the treatment of aseptic olecranon bursitis.

Key words: Olecranon bursitis, doxycycline, sclerotherapy, ultrasonography, injections, elbow

BACKGROUND

The superficial nature of the olecranon bursa lends itself to a high risk of inflammation from infection or trauma, but olecranon bursitis can also be associated with inflammatory conditions such as psoriatic arthritis and gout, or chronic medical conditions such as end-stage renal disease requiring long-term hemodialysis, and diabetes mellitus. No matter the cause, the result is an inflammatory pathway leading to swelling caused by protein and synovial-type fluid leaking into the bursa (1). Sclerotherapy with doxycycline is documented in the current literature to treat malignant pleural effusions, vascular and lymphatic malformations, Morel-Lavallée lesions, seromas, and hepatic cysts, as well as in a single case series on landmark-guided injections for olecranon bursitis (2-4). Sclerotherapeutic agents such as doxycycline, bleomycin, ethanol, tetracycline, and talcum powder have been used to treat many other tissue separations leading to potential space for fluid to collect (5-7). In the case of aseptic olecranon bursitis, a sclerosing agent can be injected into the bursa and lead to scarring of the bursa, thus preventing further fluid accumulation (8).

Two-thirds of olecranon bursitis cases are aseptic and occur from repetitive trauma or sports injuries (1). Conservative management is preferred when septic bursitis isn't suspected. However, olecranon bursitis can be recurrent and refractory to conservative management. Other options often cited in the literature for treating aseptic olecranon bursitis include corticosteroid injection and bursectomy. Corticosteroid injections have been associated with increased complications such as infection, skin atrophy, and skin depigmentation (9). Bursectomy, as with any surgical procedure, comes with additional risks

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Disclaimer: There was no external funding in the preparation of this manuscript.
Conflict of interest: Each author certifies that he or she, or a member of his or her immediate family, has no commercial association (i.e., consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted manuscript.
Accepted: 2021-06-10, Published: 2021-08-31

to the patient; however, sclerotherapy is a nonsurgical treatment option that can be performed in the office.

CASE

A 55-year-old, right hand-dominant woman with a history of meningioma resection complicated by spastic left hemiparesis and epilepsy, heparin-induced thrombocytopenia, and deep vein thrombosis on systemic oral anticoagulation with rivaroxaban was referred for evaluation of left olecranon bursitis. She reported a several-week history of left elbow pain and swelling without any particular inciting event or trauma. She complained of increased sensitivity to touch and slightly decreased elbow range of motion. She otherwise denied any new focal neuromuscular deficit or constitutional symptoms, such as fevers, chills, night sweats, or recent illness. She denied redness or drainage at the site of the posterior elbow swelling. She uses a wheelchair and typically rests her arms on the armrests of the chair, but her wheelchair is not a new device and hasn't had any recent modifications.

On physical examination of the left upper limb, she had reduced elbow range of motion lacking approximately 5 degrees of extension with associated swelling and tenderness at the posterior elbow and olecranon. There was no visible ecchymosis, erythema, wound, or drainage. The musculoskeletal and neurovascular examination was otherwise stable from prior with spastic left hemiparesis.

After obtaining consent, the patient elected to undergo ultrasound-guided bursa aspiration and sclerosant injection with doxycycline. The procedure was carried out using sterile technique and under direct sonographic guidance to ensure accurate needle placement. A 15-7-MHz linear array ultrasound transducer (Affinity System, Philips Healthcare, Bothell, WA) was used to advance a 21-gauge, 2-inch needle under continuous ultrasound guidance to the bursal space (Fig. 1). Approximately 6 mL of fluid was aspirated and sent for fluid analysis. This was followed by slow injection of the treatment solution, which was a total of 10 mL consisting of 100 mg doxycycline powder reconstituted and suspended with 0.9% preservative-free normal saline. Following the procedure, the patient was instructed to wrap and provide gentle compression to the elbow for up to 3 weeks. Of note, analysis completed on the aspirated fluid was negative for bacterial organisms or crystal deposits. The patient was seen in follow-up 8 weeks later with resolution of her posterior elbow swelling. She continues to be followed by our stroke rehabilitation clinic and is without recurrence of olecranon bursitis.

DISCUSSION

Initial treatment for aseptic olecranon bursitis should include conservative measures, such as rest, ice, compression, and nonsteroidal anti-inflammatory drugs. However, recurrence of olecranon bursitis is

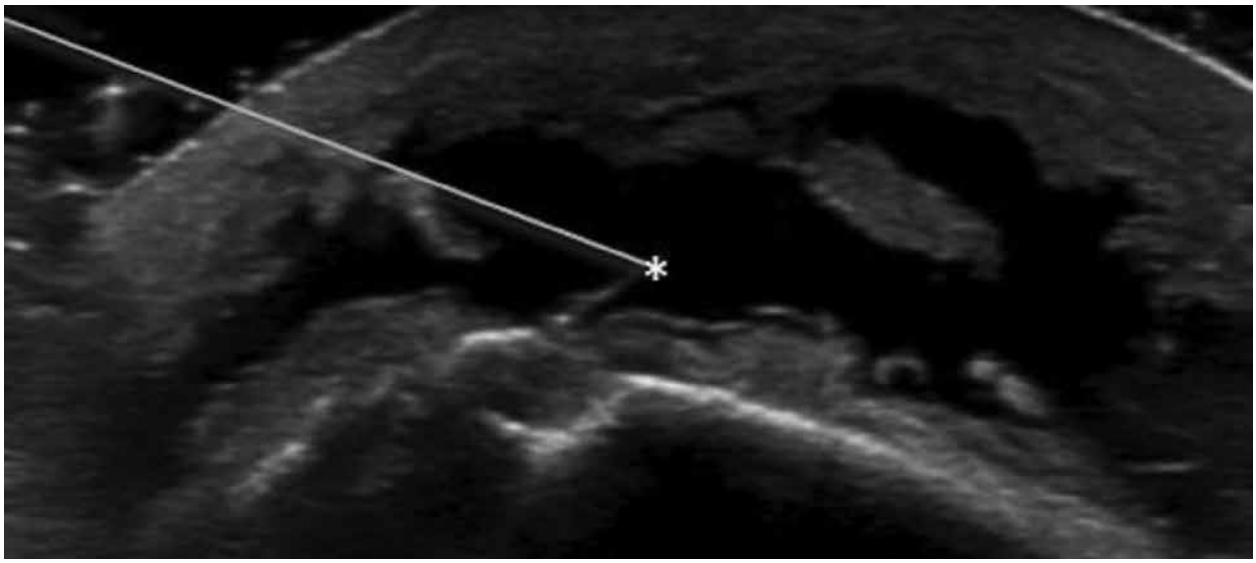

Fig. 1. In-plane, long-axis trajectory view of needle placement within the olecranon bursa.
Line and * = needle position.

not uncommon and can lead a patient down a more aggressive treatment path including nonsurgical and surgical interventions. Literature reviews comparing conservative management, corticosteroid injections, and bursectomy have found conservative measures to have similar treatment outcomes but lower complication risks when compared to more invasive treatments. A systematic review done by Sayegh and Strauch (10) suggests that nonsurgical management of olecranon bursitis leads to better clinical resolution compared to surgical management. Studies investigating sclerotherapy as a nonsurgical treatment for olecranon bursitis are lacking. A case series by Close and Hill (7) highlighted 3 cases of landmark-guided aspiration and injection of doxycycline for aseptic olecranon bursitis. These 3 cases highlighted resolution of posterior elbow swelling at 2 to 3 weeks post injection follow-up appointments; and the bursitis had not recurred at the second follow-up visits, which were 5 or 6 months after the doxycycline injection. Doxycycline is a preferred sclerosant as it is readily available at a low cost and has a low risk profile (2). Other sclerosants are more expensive, like bleomycin, or painful on administration, such as talcum powder (8). Use of doxycycline as a sclerosant has been documented for treatment of vascular malformations, lymphatic malformations, Morel-Lavallée lesions, seromas, hepatic cysts, and malignant pleural effusions (2-4,8,11,12).

The olecranon bursa lies superficial to the triceps tendon at the posterior elbow over the olecranon (13). This bursa is a potential space under normal conditions and consists of synovium-lined collagenous connective tissue (14). The exact mechanism of sclerosis of the bursa is unknown but is likely related to irritation of the mesothelial lining of the bursa leading to fibrosis or scarring (8,15). The fibrosis eliminates the bursal space and prevents fluid accumulation (15). Doxycycline as a sclerosing agent has been shown to have few complications. When administered for Morel-Lavallée lesions, a small number of patients experienced more immediate adverse effects including mild to moderate postprocedural pain and low-grade fever attributed to the activation of inflammatory pathways. Longer-term complications involved soft tissue fibrosis and adherence to adjacent tissue explained by fibrosis (8).

The case series by Close and Hill and our case report show promise for an in-office injection procedure for the treatment of olecranon bursitis that carries less complication risk than corticosteroid injections and surgical bursectomies. Using a sterile injection technique to administer a sclerosant carries a lower risk than a surgical procedure and is less of a financial burden, as this is an outpatient clinic procedure. Utilization of ultrasound guidance has additional benefits, including confirmation of accurate placement leading to a higher success rate of injection and fewer complications (13). Our patient had additional comorbidities, including deep vein thrombosis requiring anticoagulation and epilepsy, that made her an unideal surgical candidate for bursectomy.

Limitations of the study are those inherent in a case report. The authors cannot conclude that improvement in symptoms were due exclusively to the intervention, a combination of compression, or natural resolution of symptoms.

CONCLUSION

Further investigation is needed but our case and the few other cases noted in the literature have shown resolution of olecranon bursitis at 5-to-6 month follow-up. Aspiration and injection of doxycycline with ultrasound guidance should be considered in a patient who has failed conservative management or who has recurrent aseptic olecranon bursitis.

REFERENCES

1. Pangia J, Rizvi T. Olecranon bursitis. In: *StatPearls [Internet]*. Treasure Island, FL: StatPearls Publishing; 2020.
2. Mautner K, Sussman W. Intramuscular vascular malformations: A rare cause of exertional leg pain and a novel treatment approach with ultrasound-guided doxycycline sclerotherapy. *Am J Sports Med* 2015; 43:729-733.
3. vanSonnenberg E, Wroblicka J, D'Agostino H, et al. Symptomatic hepatic cysts: Percutaneous drainage and sclerosis. *Radiology* 1994; 190:387-392.
4. Ramkumar A. Doxycycline sclerotherapy to manage seroma following breast cancer surgery. *Indian J Surg Oncol* 2020; 11:23-24.
5. Lohela P. Ultrasound-guided drainages and sclerotherapy. *Eur Radiol* 2002; 12:288-295.
6. Goldwirth M, Krasin E, Goodwin D. Talcum powder in revision surgery for olecranon bursitis. Good outcome in 11 patients. *Acta Orthop Scand* 1999; 70:286-287.
7. Close E, Hill G. Doxycycline as sclerotherapy for recurrent aseptic olecranon bursitis, A new application of an existing therapy. *EC Orthopaedics* 2018; 9:211-217.
8. Bansal A, Bhatia N, Singh A, Singh A. Doxycycline sclerodesis as a treatment option for persistent Morel-Lavallée lesions. *Injury* 2013; 44:66-69.
9. Khodaee M. Common superficial bursitis. *Am Fam Physician* 2017; 95:224-231.
10. Sayegh E, Strauch R. Treatment of olecranon bursitis: A systematic review. *Arch Orthop Trauma Surg* 2014; 134:1517-1536.
11. Harrington A, Tackett J, Graeber B, Cowles R. Doxycycline sclerotherapy for post-traumatic inguinal lymphocele in a child. *BMJ Case Rep* 2018; bcr2017222795.
12. Francis J, Levine L. Aspiration and sclerotherapy: A nonsurgical treatment option for hydroceles. *J Urol* 2013; 189:1725-1729.
13. Wu Y, Chen Q, Chen K, et al. Clinical efficacy of ultrasound-guided injection in the treatment of olecranon subcutaneous bursitis. *J Xray Sci Technol* 2019; 27:1145-1153.
14. Ecker J, Ebert J, Taheri A, Mathew R, Chee D, Breidahl W. The existence of cords in olecranon bursae. *J Shoulder Elbow Surg* 2015; 24:292-295.
15. Chao C, Wu M. Dialysis elbow. *QJM* 2012; 105:485-486.