The Journal of Foot & Ankle Surgery xxx (2016) 1–5

Contents lists available at ScienceDirect

The Journal of Foot & Ankle Surgery

journal homepage: www.jfas.org

Case Reports and Series

Ultrasound-Guided Therapy for Knee and Foot Ganglion Cysts

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ARTICLE INFO

Level of Clinical Evidence: 4

Keywords:
aspiration
extremity
ganglia
ganglion cyst
injection
ultrasound

ABSTRACT

The present study evaluated the effectiveness of ultrasound-guided aspiration/injection of ganglion cysts in the lower extremities (knee and foot) that required referral to the radiology department for precise localization. The present study is the first series to describe such results. The study population consisted of 15 patients who had undergone treatment from April 2012 to January 2015. Follow-up was by telephone survey, which was performed at a mean of 15 ± 6 months after treatment. Almost 90% of patients experienced immediate improvement in symptoms (mostly pain), and 77% of these patients had not experienced a recurrence of symptoms at a mean follow-up time of 14 ± 6 months. In conclusion, ultrasound-guided therapy is a safe and potentially effective treatment for most cases of symptomatic lower extremity ganglion cysts.

Ganglion cysts are mucin-filled cysts around the joints and tendons that can cause substantial pain and impairment, depending on their location (1–3). Management of symptomatic ganglion cysts ranges from observation to aspiration/injection and surgical excision. Traditionally, the mainstay of surgical treatment has been open ganglionectomy. However, even within the realm of surgical management, interest in less invasive alternatives such as arthroscopic resection of ganglion cysts in the wrist has been increasing (4,5). In parallel, a trend has occurred toward nonsurgical management of these cysts using ultrasound (US) to guide aspiration and therapeutic injection (6–9). Although superficial, palpable cysts can be aspirated blindly in the office depending on physician comfort and expertise, US guidance is especially important when these cysts are deeper, smaller, and/or located near sensitive structures such as arteries and nerves.

Although aspiration/injection has been associated with greater rates of recurrence compared with excision, surgery often results in increased morbidity, recovery times, and costs (10,11). The published data on US-guided therapy of ganglion cysts have generally been of the upper extremities (12–16). Only scant data, consisting mainly of case reports, have been published regarding the short- and long-term effectiveness of US-guided ganglion cyst treatment in the lower extremities (3,6–8).

Our goal was to determine the degree and duration of symptom improvement in patients who had received US-guided therapy specifically of lower extremity ganglion cysts. To our knowledge, the present study is the first series to describe such results.

Patients and Methods

Study Population

The institutional review board approved the present study before its initiation. From April 2012 to January 2015, approximately 30 patients had been referred by the orthopedic department to the musculoskeletal radiology department for treatment of suspected knee or foot ganglion cysts. A total of 20 consecutive patients were identified who had received diagnostic musculoskeletal ultrasound examination that confirmed the presence of a ganglion cyst, with US-guided therapy performed on these cysts during the same visit.

An attempt was made to interview all 20 patients by telephone to complete a survey consisting of 9 questions (Fig. 1). Of the 20 patients, 15 were successfully reached and agreed to complete the telephone survey. The 5 (25%) patients who were unable to be contacted were excluded from the study. One of us (B.L.J.) performed all the telephone interviews.

Ultrasound Technique

One musculoskeletal radiologist with 10 years of musculoskeletal ultrasonography experience performed the diagnostic and therapeutic ultrasound examinations. All procedures were performed using a Philips iU22 US machine (Philips, Amsterdam, Netherlands) with

Financial Disclosure: None reported.
Conflict of Interest: None reported.
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http://dx.doi.org/10.1053/j.jfas.2016.04.015

1. Have you ever received any other form of treatment for ganglion cysts of the legs or feet?

Yes/No

2. If you have received other treatment for the ganglion cyst, was it performed before or after the cyst aspiration? What was the other form of treatment (surgery, aspiration, other)?

Before/After
Surgery/Aspiration/Other

3. What was your level of pain prior to ganglion cyst aspiration?

No pain/Mild pain/Moderate Pain/Severe pain

4. Prior to cyst aspiration, did the ganglion cyst limit your ability to perform daily activities (walking, performing chores or work activities, etc)?

No limitations/Mild/Moderate/Severe

5. Did your pain improve, worsen, or remain unchanged after ganglion cyst aspiration?

Unchanged/Improved slightly/Improved significantly/Worsened slightly/Worsened significantly

6. Did your ability to perform daily activities improve after cyst aspiration?

Unchanged/Improved slightly/Improved significantly/Worsened slightly/Worsened significantly

7. Did you experience a recurrence of pain or symptoms after cyst aspiration? If so, approximately how long after the cyst aspiration?

Yes/No/Not applicable (i.e. never improved to begin with)
Time Interval

8. Would you want to undergo ganglion cyst aspiration again if you had another ganglion cyst?

Yes/No/Unsure

9. Would you prefer to undergo surgery or no treatment as an alternative to cyst aspiration if you developed another ganglion cyst?

Yes/No
If yes, Surgery/No treatment

Fig. 1. Telephone survey regarding ganglion cyst aspiration.

high-resolution 12- to 17-MHz transducers. A complete diagnostic US examination of the extremity was performed in all cases before therapy during the same visit. A ganglion cyst was diagnosed by identifying the characteristic ultrasound features, specifically a well-defined, anechoic or mildly complex, soft tissue lesion demonstrating acoustic enhancement, lacking internal vascularity, and showing variable degrees of compressibility. After identification of the ganglion cyst to be treated, the area over the cyst was marked, draped in a sterile fashion, and infiltrated with 3 to 7 mL of 1% lidocaine. A 20- to 22-gauge needle was advanced into the ganglion cyst using an in-plane approach and free hand technique (Fig. 2). If the cyst contents could not be spontaneously aspirated, saline was injected to