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Case Study

Radiographic changes induced after cervical facet radiofrequency denervation

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Abstract

BACKGROUND CONTEXT: Paraspinal infections after zygapophyseal (facet) radiofrequency denervation (RFD) are a serious but rare complication of this procedure. We are aware of only one case report of an epidural abscess after facet joint injection.
PURPOSE: To report post-procedure inflammatory changes after cervical facet RFD.
STUDY DESIGN: Case report.
PATIENT SAMPLE: A 35-year-old Caucasian female.
METHODS: Retrospective case review.
RESULTS: The patient underwent cervical RFD and was admitted to the hospital 7 days after her procedure with severe neck pain. Magnetic resonance imaging (MRI) with contrast revealed what appeared to be evidence of a paraspinal muscle abscess although blood tests were negative. She was treated with antibiotic therapy, yet she never developed systemic signs of infection. A follow-up MRI without contrast revealed no evidence of infection, and she was discharged home on hospital day 6. At her first follow-up visit, she was still experiencing scalp pain and paraspinal muscle spasm. During subsequent follow-up visits, she has continued to improve clinically without experiencing signs of infection. Another follow-up MRI 6 weeks after her discharge home revealed persistent minimal left paraspinal enhancement at C2–3, possibly representing post-procedure granulation tissue with no evidence of abscess.
CONCLUSIONS: Post-procedural MRI findings after radiofrequency lesioning can resemble radiographic findings associated with a paraspinal abscess. Patients with radiographic findings consistent with abscess should only be treated if clinical signs or symptoms of systemic infection are present.

Keywords: Abscess; Epidural; Rhizotomy

Introduction

Radiofrequency denervation (RFD) is a technique in which insulated needles are percutaneously placed to defined targets and radiofrequency waves are emitted from an exposed needle tip. A small, controlled thermal lesion is created circumferentially in tissues approximately 3 mm adjacent to the needle tip [1]. RFD of the zygapophyseal (facet) joints can effectively reduce musculoskeletal pain stemming from facet joint arthropathies (spondylosis). Each facet joint is supplied by the medial branch of the dorsal ramus of the nerve root above and below as they exit their respective neural foramen [2]. In order to obtain successful RFD, therefore, the medial branches both cephalad and caudal to each joint must be lesioned. The symptoms of facet pain are often nonspecific and can include weather-related dull aching neck, thoracic or low back pain which is often worse with hyperextension. Patients may also have tenderness to palpation over the corresponding facet joints. Imaging studies (X-ray, computed tomography scan, magnetic resonance imaging [MRI]) may be negative or often show only degenerated, hypertrophic joints whereas bone scanning can often reveal increased radiopharmaceutical uptake in degenerative joints. In patients whose spinal pain is thought to be mediated

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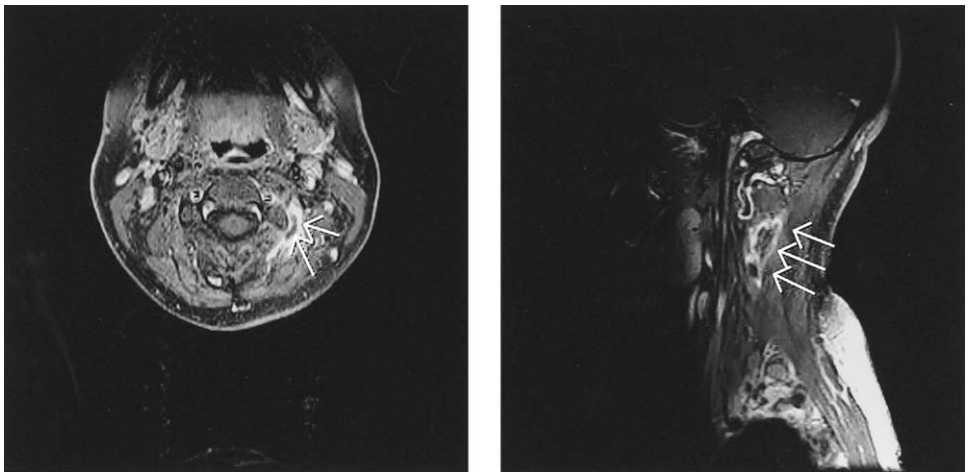

Fig. 1. Axial T1 (left) and sagittal T1 (right) post-contrast MRI images showing ring-enhancing fluid collection in the left paraspinal muscles on the day of admission, 7 days after her C2–4 radiofrequency lesioning.

from the facet joints, a diagnostic medial branch block with local anesthetic is performed to determine whether RFD will be likely to benefit the patient. If the patient responds positively to the medial branch block as demonstrated by reduced pain and improved range of motion, RFD is offered to the patient at a later date. Optimally, facet nerve RFD should only be offered to patients with substantial (greater than 75%) pain relief from the diagnostic medial branch block [3]. Risks of RFD are small but include bleeding, infection, and nerve damage to spinal nerve roots or the spinal cord. In the literature, only one case of epidural abscess after facet joint RFD has been reported [4]. We report a case of a patient undergoing cervical RFD who post-procedurally was initially diagnosed with a paraspinal abscess based on radiographic findings.

Case report

A 35-year-old otherwise healthy female underwent a left C2, C2-3 (third occipital nerve), C3, and C4 (four level) cervical medial branch RFD for treatment of her intractable neck pain with associated headaches. The procedure was performed in a hospital-based outpatient pain management center by an experienced practitioner. Neither sedation, nor preoperative antibiotics were used for either of her procedures. The patient was prepared using a povidone iodine solution and draped in a standard fashion. Four separate disposable RFK-C10-D-S radiofrequency needles were used for the procedure with a single-needle, single-glove technique. Previously the patient had responded well to a diagnostic medial branch block of the same nerves. She experienced only moderate discomfort during both procedures, which were performed 2 weeks apart. Several days after her RFD, she began to experience more sensitivity of her scalp and posterior cervical region. She also began complaining of increased neck pain and non-migraine type headaches. In addition, she began noticing a tender swollen area on her scalp superior to the injection site.

Seven days after her RFD she presented to her local neurologist whom she had been seeing for her chronic migraine headaches. Based on her new complaints, an MRI of the cervical spine was obtained with and without contrast. The MRI report stated: “There is edema and enhancement within the left paraspinal soft tissues adjacent to the C2-3 and C3-4 facet joints. There is also a peripherally enhancing fluid collection as described above consistent with small abscess” (Fig. 1). The patient was started on broad-spectrum antibiotics (cefepime and vancomycin) in the emergency department, and orthopedic, infectious disease, and pain management consultation was obtained. The patient was subsequently admitted for observation. Blood cultures were obtained and were reported as negative for infectious process

Fig. 2. Axial T2–weighted image obtained on post-procedure day 12 demonstrating persistent left paraspinal lesion at approximately C2–3.