

Original Article

Radiofrequency Ablation of Osteoid Osteoma in Common and Technically Challenging Locations in Pediatric Population

Abstract

Context: Percutaneous radiofrequency ablation (RFA) of osteoid osteoma has a high technical and clinical success rate. However, there is limited data on its use in the pediatric population, especially in technically challenging locations. **Objective:** The objective of this study was to assess the safety and efficacy of CT-guided percutaneous RFA of osteoid osteoma in pediatric population. **Subjects and Methods:** From June 2009 to May 2014, thirty patients with osteoid osteoma were treated with CT-guided RFA in common (25 cases) and technically challenging (five cases: four near articular surface and one in sacrum) locations. Therapy was performed under general anesthesia with a three-array expandable RF probe for 6 min at 90°C and power of 60–100 W. The patients were discharged next day under instruction. The treatment success was evaluated in terms of pain relief before and after (1 day, 1 month, and 6 months) treatment. **Results:** Technical success was achieved in all patients (100%). Primary clinical success was 96.66% (29 of total 30 patients), despite the pediatric population and atypical location. One patient had persistent pain after 1 month duration and were treated successfully with a second procedure (secondary success rate was 100%). One patient had immediate complication of weakness of right hand and fingers extension. No delayed complications were observed. **Conclusions:** CT-guided RFA is relatively safe and highly effective for treatment of osteoid osteoma in pediatric population, even in technically difficult locations. **Advance in Knowledge:** Our study showed that if technical success is 100% and if strict desired temperature (90°C) can be maintained for desired time (6 min) using controlled power (wattage) delivery (60–100 W), then high clinical success can be achieved even in pediatric population similar to adult population.

Keywords: Computed tomography guided, osteoid osteoma, pediatric population, radiofrequency ablation

Introduction

Osteoid osteoma is a benign bone tumor consisting of an osteoid nidus in a highly vascular connective tissue stroma. These tumors are exquisitely painful and demonstrate characteristic findings on clinical and radiographic examinations.^[1,2] The traditional treatment of osteoid osteoma consists of surgical *en bloc* excision.^[2-4] The major drawback of this traditional approach is prolonged surgery and hospital stay, weakening of the bone requiring a prophylactic fixation and its subsequent removal, and additional time off school due to open surgery. To overcome this drawback, different minimally invasive techniques have been described as alternative therapeutic options (radiofrequency ablation [RFA], laser photocoagulation, and percutaneous resection).^[3-7] CT guidance has become a very useful and easy method

for the percutaneous treatment of these lesions.^[8] We started using CT-guided RFA for osteoid osteoma 5 years ago and immediately noted many beneficial effects in terms of duration of hospital stay, morbidity, and overall patient comfort prompting us to do this study. We report our experience with CT-guided percutaneous RFA of osteoid osteoma in common and technically challenging locations in 30 pediatric patients and evaluate technical and clinical results.

Subjects and Methods

This is a retrospective observational study of 30 pediatric and adolescent patients who underwent CT-guided percutaneous RFA of osteoid osteoma between June 2009 and May 2014. All patients reported severe pain that usually increased at night and required nonsteroidal anti-inflammatory

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