



Post radiofrequency full thickness burn in a case of osteoid osteoma of ulna: A case report and review of literature

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General Note

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ABSTRACT

Case: 33-year-old male was diagnosed as a case of Osteoid Osteoma of right Ulna based on clinical history and radiological investigation. After failed conservative management, the patient opted for radiofrequency ablation (RFA) as a treatment option. Two weeks post procedure; the patient developed a deep full thickness skin necrosis at the procedure site. The wound was managed with debridement and negative Pressure wound therapy (NPWT) followed by secondary wound closure. *Conclusions:* Full thickness thermal skin necrosis is one of the rare potential complications of RFA. NPWT can play an important role and hasten wound healing in such cases.

Keywords: Osteoid osteoma, negative Pressure wound therapy, radiofrequency ablation

1. INTRODUCTION

Osteoid osteoma (OO) is a benign neoplastic lesion, characterized by a less than a 2 cm, pea-like mass of abnormal bone, and the nidus. The nidus is richly innervated, causing pain usually without systemic symptoms. Treatment options classically include long-term analgesia and surgical excision of the nidus. Aspirin or other NSAIDs frequently provide effective pain control; however, long-term therapy may be unacceptable because of refractory pain, and recurrent nocturnal pain with resultant sleep deprivation or gastrointestinal complications (Finstain et al., 2008). Nowadays minimally invasive radiofrequency ablation (RFA) is being preferred as a management option for OO over surgical excision of the nidus. RFA is relatively safe procedure but complications have been reported. The patient was informed that his clinical data can be published in Academic journal with which he agreed.

2. CASE HISTORY

A 33 years old male complained of pain and swelling in the right forearm for two years, his pain was constant, progressive, was worse at night and used to get relieved by Non-steroidal anti-inflammatory medications (NSAIDs).



Figure 1 Plain Radiograph of right forearm

Based on the patient symptoms and clinical presentation, a provisional clinical diagnosis of Osteoid osteoma (OO) of ulna was made, which was later confirmed with radiological investigation. Antero-posterior (AP) and Lateral radiograph of the right forearm revealed an intensely reactive bone around radiolucent nidus in the middle third of the ulna (Figure 1). Computed tomography (CT) scan of the right forearm (Figure 2) showed 6 cm long oval lesion arising from posteromedial aspect of cortex of midshaft ulna with central nidus with sclerotic reactive bone thickening, thus confirming the diagnosis of OO of the ulna.

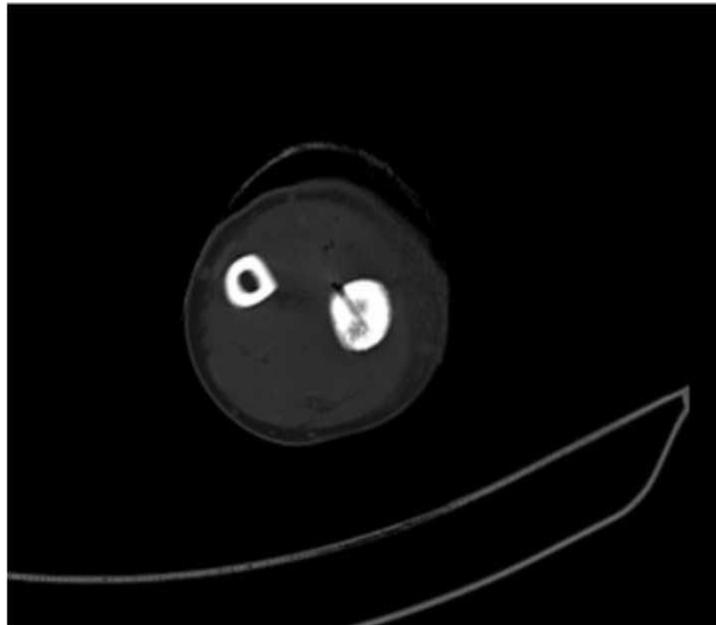


Figure 2 CT scan axial cut showing the nidus in the Ulna



Figure 3: Clinical photograph showing full thickness Burn over the RFA ablation site with zone of blackish discoloration

The patient was initially managed with conservative trial of pain control with NSAIDs and limitation of activity for 6 weeks. After failure of initial conservative trial, other available treatments options including surgical resection with curettage of the lesion and radiofrequency ablation (RFA) were discussed with the patient. The patient opted for RFA. After written informed consent, the

patient was undertaken for RFA of the nidus under regional anesthesia along with interventional radiologist. A CT scan of the right ulna was performed. The osteoid osteoma was localized within the posterolateral aspect of the right ulna and the proper trajectory for the drill bit was confirmed. The skin was marked to confirm this location. A small skin incision was made to accommodate 2.7 mm drill bit. A penetration cannula with an inner stylet was introduced through the skin and soft tissue and the position was confirmed under in three dimensions. Bone penetration was performed by inserting a Kirshner wire (K-wire) through the cannula into the center of the nidus. Once within the nidus, the K wire was replaced with the RFA probe (Rita Star Burst XL). Ablation was performed at 90 degree Celsius for 5 minutes. The patient tolerated the procedure well. Post operatively he was given oral antibiotic and analgesic for one week and was discharged.



Figure 4 immediate postoperative clinical photographs after Negative Pressure Wound therapy (NPWT) post wound debridement.



Figure 5 Healthy Granulation tissue seen 05 days Pos NPWT application



Figure 6 Clinical photograph showing satisfactory wound closure in the second stage, after 05 days of NPWT application.

Patient reported two weeks after the index procedure with increased localized pain on the posterior aspect of ulna. On examination there was approximately 3 cm oval full thickness burn noted over the posterior aspect of ulna with surrounding skin blackish discoloration and sloughed out tissue (Figure 3). Bone was exposed and visible through the wound. Minimal serous drainage was present. Erythrocyte sedimentation rate (ESR) and C - reactive protein (CRP) were within normal limits. The wound was managed with debridement and Negative pressure wound therapy (NPWT) in the first stage (Figure 4).

After application of NPWT for 05 days, healthy granulation tissue was seen (Figure 5), so secondary wound closure was done in the second stage (Figure 6). The intraoperative wound sent for culture and sensitivity was negative. Patient was given 02 days of Injectable second generation cephalosporin followed by one week of oral cephalosporin, per hospital protocol. At the latest follow up of 12 months, the wound was well healed without any neurological deficit.

3. DISCUSSION

Osteoid Osteoma (OO) is a benign bone lesion affecting young person. It is more common in males as compared to females (3:1). It is characterized by night pain, which is typically relieved by the use of non Steroidal Anti Inflammatory drugs (NSAIDs) and often leads to functional loss (Chahal et al., 2017; Daniilidis et al., 2012; De Filippo et al., 2018; Donkol et al., 2008). If the conservative management fails, en-bloc surgical resection of the lesion has a reported success rate between 88% and 100% but it carries several significant drawbacks. For the operating surgeon it can be difficult to precisely identify the location of the lesion and to determine the exact amount of bone to be resected. Also to be sure all the nidus is removed, the surgeon can end up removing a substantial volume of bone leading to secondary instability and bone weakness (Finstein et al., 2006; Gallazzi, 2001; Kulkarni et al., 2017; Lyon and Buckwalter, 2008; Paladini et al., 2018; Pinto et al., 2002). This may require augmentation in the form of bone grafting or internal fixation to prevent the disastrous complication of fracture. RFA overcomes these limitations of surgical management has become a preferred modality of management in the OO. It has several advantages like being minimally invasive and precise. Also RFA can be performed as a day care procedure as compared to surgical management of OO (Pinto et al., 2002). Even though, RFA is a relatively safe procedure, certain complications are also associated with this procedure. Recurrence due to inadequate thermal ablation of nidus has been reported (Finstein et al., 2006; Kulkarni et al., 2017; Lyon and Buckwalter, 2008).

Table 1 Literature Review of the Thermal burn complications with RFA in the management of Osteoid Osteoma.

Sr No	Authors name	Year	Study type	Anatomical Location	Complications	Wound Management
1	Gallazzi MB et al ⁶	2001	Case Series	Tibia	Recurrence Eschar at entry site	Conservative
2	Pinto C.H et al ¹⁰	2002	Case Series	Tibia	Superficial Skin Burn	Conservative
3	Finstein at al	2006	Case Report	Tibia	Full Thickness Skin Burn	Conservative
3	Lyon C et al ⁸	2008	Case Report	Tibia	Full thickness cutaneous burn	Conservative
4	Kulkarni et al ⁷	2017	Case series	Femur = 29 Tibia = 07 Vertebrae =03 Ulna=02 Scapula and Calcaneum 01 each	Skin burns at the site of treatment	Conservative
5	Current Study	2019	Case Report	Ulna	Full thickness Skin Necrosis and wound infection	Negative Suction therapy and secondary wound closure

In some cases post procedure pain may persist. Full thickness skin burns at the site of probe entry have been noted. On review of literature, we found few cases of thermal burn post RFA (Table 1). In our case we report a case of full thickness skin burn in a case of OO of ulna after RFA. Various precautions like using an appropriate size probe according to the lesion as well as retracting the bone

penetration cannula 1 cm above skin, can avoid thermal skin burns (Pinto et al., 2002). In one of the paper it has been hypothesized that cutaneous burns occur due to a defect of the insulation material covering the thermal ablation cannula (Pinto et al., 2002). This can be the cause of full thickness thermal burn in our case. The management of this burn can also be problematic considering the extent and thermal injury leading to decreased wound healing potential. The time taken for wound healing in one of the previously reported cases was around eight months (Finstein et al., 2006). Use of negative suction therapy in such cases can significantly reduce the wound healing time by assisting healthy granulation tissue formation, which can later be closed with secondary wound closure or skin grafting as needed (Nugent, 2005).

4. CONCLUSION

RFA is the preferred treatment option in the management of Osteoid osteoma and has several advantages over operative treatment. Full thickness skin burn is a potential and devastating complication, which can be prevented by taking few precautions. Vacuum assisted closure (VAC) can play an important role in the early healing of these thermal wounds as compared to conventional dressings.

Abbreviations

OO = Osteoid Osteoma
 RFA= Radiofrequency Ablation
 CT= Computed Tomography
 VAC=Vacuum Assisted Closure

Conflict of interest

The authors declare that they have no conflict of interest

Informed consent

Written and oral informed consent was obtained from all participants in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

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Data and materials availability

All data associated with this study are present in the paper.

Peer-review

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