

## Case Report

# Parosteal Lipoma of the Proximal Radius

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## Introduction

Lipomas are common benign soft-tissue tumors, which are usually asymptomatic [1]. Grossly, they are encapsulated, yellow soft tissue masses that may also have other tissue components incorporated within them. These lipomas are named according to the coexisting tissues; such as angiolipoma, fibrolipoma and osteolipoma [2].

Osseous lipomas have been classified according to their site of origin: either within bone (intraosseous) or on its surface (juxtacortical). Surface osseous lipomas are subdivided into Parosteal and subparosteal lipomas, depending on their relationship to the bone periosteum [3]. To the best of the author's knowledge, about Parosteal lipomas have been reported to date, representing less than 0.3% of all lipomas. These unusual masses most frequently arise in the femur, tibia, humerus and radius [4,5].

## Case Report

A 62 year old woman presented with a palpable mass in the anterior left proximal forearm. She had noticed the mass enlarging over the preceding year, but denied any pain or loss of function associated with anterior intraosseous nerve compression, such as loss of pincer grip. Physical examination revealed a fixed, nonpulsatile mass over the volar radius. The patient had full range of motion at the elbow, wrist and fingers, but did show a mild decrease in grip strength compared to the contralateral hand. She denied any tenderness upon diffuse palpation.

Conventional radiographs of the left forearm displayed an oval density in the soft tissues volar to the radial shaft (Figure 1). Magnetic Resonance Imaging (MRI) done the same day demonstrated a well-defined mass composed of mostly fatty tissue, with diffuse areas of hypo intensity, consistent with cortical bone, which was contiguous with the cortical bone on the volar radial shaft (Figure 2). A whole-body bone scan showed increased activity in the region of the

### Abstract

Parosteal lipomas are described as surface osseous lipomas which are contiguous with the periosteum. They represent 15% of osseous lipomas and most occur in the fifth and sixth decades with a slight male predilection. To date, only 150 of these tumors have been reported in the literature. We present a rare case of Parosteal lipoma with cytogenetic correlation. The clinical implications of this lesion will also be discussed.

**Keywords:** Parosteal lipoma; Forearm; Tumor

proximal radius, consistent with erosion of the radial cortex by the adjacent lesion.

Computed Tomography (CT) of the left forearm revealed a focus of ossification in continuity with the volar radial shaft surrounded by fat, suggesting a Parosteal Lipoma (Figure 3). The mass began 5.9cm distal to the radial head and extended 6cm distally. Radiographically the lesion was compressing the flexor digitorum profundus and the anterior intraosseous neurovascular bundle. Based on imaging, the mass was suspected to be benign and the patient was indicated for a marginal excision.

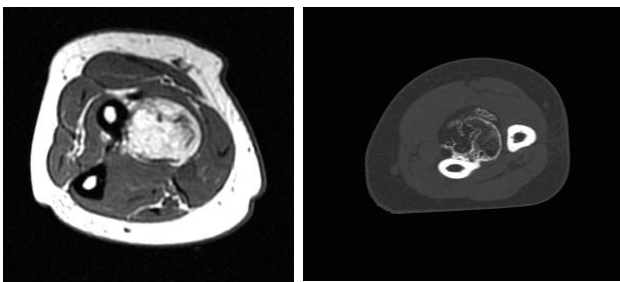
At the time of surgery, a 12cm incision was made over the mass to the level of the fascia, utilizing the interval between the brachioradialis and pronator teres. The fascia was then incised and retracted, at which point the radial artery was identified and feeding vessels branching



**Figure 1:** A and B-Radiographs forearm. (A). Frontal radiograph of the left forearm: There is an ossify density adjacent to the ulnar cortex of the radial shaft (arrowheads). Subtle thickening of the cortex is seen (open arrow). (B). Sagittal radiograph shows surrounding radiolucent lipomatous mass (open arrow) and ossify density adjacent to volar cortex of radius (arrowhead).



**Figure 2:** Axial CT image of left forearm demonstrate ossify excrescence on the volar cortex of the radial shaft, without medullary continuity. It is surrounded by a lipomatous soft tissue mass.



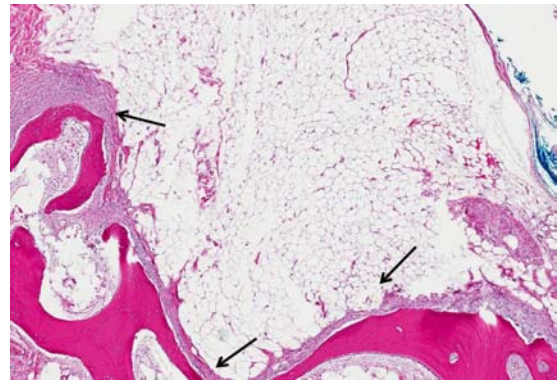
**Figure 3:** Short axis MR T1W image of left forearm shows ossify density filled with fatty marrow on the volar cortex of the radius. There is no medullary continuity. Thin lipomatous mass surrounding lesion with the underlying volar radial shaft periosteum.



**Figure 4:** Intraoperative photo depicting the surgical approach and anatomic location of the mass.

from the artery were ligated to maintain hemostasis. The pronator teres and flexor Carpi radialis were retracted medially and the brachioradialis laterally to visualize the lesion (Figure 4).

The lesion was resected from surrounding soft tissues and a firm attachment to the proximal radial shaft was noted. The mass and underlying periosteum were resected along with a small superficial portion of the radial cortex using anosteotome with care taken to avoid fracturing the radius. Following resection the radius was



**Figure 5:** Mature adipose tissue mass demonstrating attachment to theperiosteum (arrows) with underlying bone (Hematoxylin and eosin, 100X).

confirmed to be intact through fluoroscopic imaging.

The specimen was submitted for analysis by a musculoskeletal pathologist. Grossly the specimen was noted to be composed of an adipose tissue mass demonstrating an intimate association with the underlying bone. As per protocol, the specimen was submitted for cytogenetic analysis. Histologically, the lesion consisted of mature adipose tissue with relatively consistently sized adipocytes demonstrating a contiguous relationship with the periosteum (Figure 5). Additionally, the lesion demonstrated a female karyotype with a derivative chromosome 12. Cytogenetic studies demonstrating rearrangements of chromosome 12q13-15 are commonly identified in lipomas. This histologic and cytogenetic finding confirmed the diagnosis of Parosteal lipoma.

Three months post-resection, of the Parosteal lipoma from the proximal radius, the patient had full range of motion of the digits, wrist and the elbow, including supination and pronation. She denied any neurovascular symptoms and the surgical site was well healed.

### Discussion

Parosteal lipomas are rare lesions of ossified adipose tissue that occur on long bones [6]. The lesions are benign, but can cause neurovascular symptoms if allowed to enlarge to the point of compression of adjacent structures [1]. When located adjacent to the neck of the radius, these masses can cause nerve compression, leading to intraosseous nerve palsies [7].

Due to the possibility of complications involved with an untreated radial neck Parosteal lipoma, it is important to treat in a timely manner. The difficulties associated with a forearm lesion resection arise as a result of adjacent vulnerable structures. Injury to neurovascular structures, as well as the possibility of fracture or loss of motion may lead to long term sequelae and loss of function. For these reasons, care must be taken to maintain the integrity of these structures.

An anterior approach to proximal volar radial shaft lesions, utilizing the interval between the brachioradialis and pronator teres allows for full visualization of the lesion and underlying proximal radius. In addition, the adjacent neurovascular bundle can be mobilized and controlled, as needed, to maintain hemostasis and avoid iatrogenic neuropathies. Using the fascial separation between

the muscles allows for minimal sequelae as a result of the surgical approach and post-operative healing.

In summary, we report on a case of a proximal volar radial shaft Parosteal lipoma, with its interesting cytogenetic abnormalities and provide an overview of the literature with regards to Parosteal lipomas.

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