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Case Report Open Access

# Bilateral Radial Artery Aneurysm: Case Report and Review of Literature

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**Abstract**

While arterial aneurysm in the lower extremities is common, upper extremity aneurysms are relatively infrequent. Radial artery aneurysms are sometimes associated with trauma and connective tissue disorders. Very few cases of radial artery aneurysm have been reported in the literature. We have encountered a case of bilateral radial artery aneurysms in a 61 year old male. A review of the English language literature was performed using Pub Med database, resulting in 31 reported cases of radial artery aneurysms, with most cases being either traumatic or idiopathic in etiology. Of these reports, bilateral aneurysms had clear etiologies, including Marfan's vasculopathy, granulomatous arteritis, arteriosclerotic disease and intra-arterial drug injection. To our knowledge, this is the first reported case of primary bilateral radial artery aneurysms.

**Keywords:** Radial artery aneurysms; Peripheral aneurysms; Vasculitis

## Case Report

A 61 year old left-hand dominant man with a history of frequent falls presented with bilateral hand pain and cellulitis. He has a history of falls in the weeks prior to presentation with redness, pain and swelling of his right wrist. Approximately a week later his left wrist and forearm also became swollen and erythematous. Physical exam revealed a moderately edematous left forearm with bilateral tender pulsatile masses at the wrists. Color flow duplex showed a maximum diameter of 1.3 and 1.5 cm of the left and right radial artery aneurysms, respectively, with intact palmar arches and bilateral radial dominance.

His past medical history includes hypertension and ischemic stroke two years ago. There was no indication from the history of connective tissue disease, and workup for vasculitis (sedimentation rate and C-reactive protein) was negative. A screening duplex of the popliteal arteries and CT of the chest and abdomen did not reveal other aneurysms.

Due to the size of the aneurysms and persistent symptoms operative management was discussed and the patient was taken to the operating room for subsequent aneurysm resection. The larger and more symptomatic aneurysm (right) side was resected first. Intraoperative findings showed significant inflammatory reaction and scar tissue encasing the aneurysm wall. There was an excellent doppler signal in the palmar and digits with the radial artery clamped. Thus we chose not to perform a bypass. A month later the patient returned for the left radial aneurysm resection. This aneurysm had septation and significant intramural thrombus. There was a radial artery dependent palmar circulation thus an interposition graft was performed with a reversed great saphenous vein. Patient experienced a full and uncomplicated recovery. Histological examination of the right aneurysm revealed fibromyxoid degeneration of the media with elastic tissue degeneration, while the left specimen showed increased perivascular inflammatory infiltrate but was not conclusive for vasculitis.

## Discussion

True aneurysms of the radial artery are rare, with most reported being false aneurysms, traumatic or iatrogenic in origin. Given normal inflammatory markers and recent history of trauma, these aneurysms are likely secondary to trauma provoked. A search of English-language literature reveals 29 cases of true radial artery aneurysms, mostly reported as single cases or case series. Tables 1 and 2 of these 4 was bilateral [1-4]. The most commonly etiologies were idiopathic and traumatic aneurysms, although it has been suggested that some of the cases of unknown etiology may be due to unrecalled trauma [3]. Other less common etiologies included mycotic aneurysms [5,6] atherosclerosis [7], NF-1 vasculopathy [8,9], vasculitis [3], and Marfan's syndrome [1,10]. The reported cases show a male predominance, with a mean age of 57 years, and most typically occur in the distal part of the artery, around the wrist and "snuffbox", where the artery is most superficial.

Most cases present as an asymptomatic swelling [2,7,11,12] but can present with paraesthesias due to radial nerve compression [13], symptoms of embolization [14] or rupture [8]. Diagnosis is often made on physical exam which shows a pulsatile mass, as well as non-invasive imaging such as doppler ultrasound. While most such aneurysms are traumatic or idiopathic in nature, efforts should be made to evaluate for vasculitis or connective tissue disease where appropriate, as well as screening for other aneurysms. Radial artery aneurysms are rare and its management is not well described. Early intervention is recommended to prevent distal embolization as well as addressing pain and compressive symptoms [15].

The most commonly reported approach for radial artery aneurysms is ligation and excision [5,12,13,16-23] which appears to be the preferred in cases where the ulnar artery is the dominant arterial supply for the hand [13,15]. In cases where the ulnar collaterals are poor or there is radial dominant circulation, options include excision and anastomosis [3,7,24] or excision with interposition vein graft [11,17] if a tension free anastomosis could not be accomplished, as in our case. A few reports exist of long term follow up for radial artery

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| Author | Sex | Gender | Size/Location | Etiology | Treatment |
|---|---|---|---|---|---|
| Yukios [1] | 74 | Female | 9 mm, 5 mm, snufbox (bilateral) | Marfans | Ligation + excision (right) |
| Malt [2] | 56 | Male | 2.0 cm,1.5 cm, wrist (bilateral) | Arteriosclerotic | Resection + anastomosis (right) |
| Leitner [3] | 69 | Female | 1.5 cm, 2.0 cm wrist (bilateral) | Granulomatous arteritis | Ligation + excision (bilateral) |
| Coppola [4] | 40 | Male | Wrist (bilateral) | Intrarterial drug injection | Ligation + excision (bilateral) |
| Shaabi [13] | 65 | Female | 2 × 1.5 cm snuffbox | Idiopathic/non-traumatic | Ligation + excision |
| Luzzani [19] | 63 | Female | 1.0 × 1.1 cm snuffbox | Idiopathic/non-traumatic | Ligation + excision |
| Yaghoubian [26] | 77 | Male | 1.0 × 1.5 cm distal to snuffbox | Idiopathic/non-traumatic | Observation |
| Claudio [18] | 47 | Female | 1.1 × 1.0 cm wrist | Idiopathic/non-traumatic | Ligation + excision |
| Walton [25] | 40 | Male | 1.5 cm snuffbox | Idiopathic/non-traumatic | Observation |
| Turner [14] | 55 | Male | 2.0 cm distal RA (antecubital fossa) | Idiopathic/non-traumatic | Resection + anastomosis |
| Filis [20] | 45 | Male | 2.0 × 3.0 cm snuffbox | Idiopathic/non-traumatic | Ligation + excision |
| Jedynak [15] | 60 | Male | Snuffbox | Idiopathic/non-traumatic | Ligation + excision |
| Lee [24] | 42 | Male | Left wrist | Idiopathic/non-traumatic | Resection + anastomosis |
| Behar [21] | 62 | Male | 1.9 cm wrist | Repetitive trauma | Ligation + excision |
| Turowski [11] | 70 | Female | 2 cm × 7 cm wrist | Traumatic | Reconstruction with interposition vein graft |
| Kadowaki [5] | 61 | Male | 2.0 × 1.5 cm snuffbox | Mycotic | Ligation + excision |
| Singh [9] | 45 | Male | Proximal radial artery | NF-1 vasculopathy | Ligation (no excision) |
| De Santis [8] | 48 | Female | Multiple proximal + distal aneurysms | NF-1 vasculopathy | Ligation + excision |
| Thorrens [7] | 60 | Male | 1.5 × 2.0 cm snuffbox | Ateriosclerotic | Resection + anastomosis |
| Goertz [10] | 52 | Male | Snuffbox | Marfans | Ligation + excision |

**Table 1:** Size location/Etiology with multiple patients.

| Author | Number pts | Location | Etiology | Management |
|---|---|---|---|---|
| Gray [12] | 2 | Distral radial artery/wrist | Repetitive trauma<br>Idiopathic | Ligation + excision<br>Observation |
| Johnson [6] | 4 | U/K | Mycotic | Ligation + excision |
| Mayall [22] | 1(41M) | Distal radial artery/wrist | Trauma | Ligation + excision |
| Ho [17] | 1 | Wrist | Blunt trauma | Reconstruction w/ vein graft |
| Igari [16] | 1 (72F) | Snuffbox | Idiopathic | Ligation + excision |
| Poirier [23] | 1(69M) | Wrist | Mycotic | Ligation + excision |

U/K = Unknown, N/A = Not Available

**Table 2:** Case series/reports with multiple patients.

reconstruction, ranging from 3 months to 5 years follow up, with most reporting no complications, including growth or recurrence of the aneurysm, but there is one published report of re-occurrence of aneurysm at 18 months [17]. We recommend pre-operative evaluation of palmar circulation with a digital doppler ultrasound.

In summary we recommend radial aneurysms to be repaired due to risks of embolization in additional to pain and compressive symptoms [25,26]. Preoperative laboratory testing should include a SED rate and CRP to exclude inflammatory components. Evaluation of the palmar circulation is necessary for operative planning. Treatment can include simple ligation, excision with primary anastomosis or with an interposition graft.

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