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Case Report

A True Finger Artery Aneurysm Without Trauma: A Case Report

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Abstract

An aneurysm is defined as a permanent dilation of an artery diameter more than 50% of its typical diameter. The aneurysm of the finger artery is a sporadic disease that divides into true and false types. A Pseudo-aneurysm of the finger artery is more prevalent than a true aneurysm; caused by penetrating trauma. A patient with a true aneurysm of the finger's artery without trauma history is reported. It was removed after proximal and distal control and heparin IV injection. The finger artery was micro-surgically repaired to maintain distal blood flow and prevent finger ischemia and adverse consequences in future trauma.

Keywords: True Finger Artery Aneurysm, Pseudo aneurysm, Microsurgery.

Introduction

The aneurysm is a permanent dilation of the artery diameter more than 50% of typical values. Aneurysms can occur in any part of the arterial tree. The occurrence of an aneurysm is different in various arteries. The aneurysm of the finger artery is a sporadic disease [1-4]. The first case of finger artery aneurysm was reported in 1982 by Layman et al. It was the ulnar artery aneurysm of the middle finger due to trauma [2,4]. According to our knowledge, until 2017, Only 23 cases of true aneurysms secondary to trauma were reported in the literature [2]. Finger artery aneurysms categorize into true and false types [1,4-5], and also they can be characterized into traumatic and non-traumatic types. Traumatic aneurysms are classified into true and false types [1], and non-traumatic cases are divided into atherosclerotic, mycotic, inflammatory, and idiopathic [4,6-7]. Percutaneous trigger finger release and fasciotomy are iatrogenic causes of this disease [7]. There were two case reports of a mycotic aneurysm due to endocarditis and accumulation of infection around the finger artery [7]. Clinicians should be suspicious in the presence of Infection, trauma, and even the family history of aneurysms. The aneurysm can be formed in two weeks to six months of injury [8]. The most common finger that suffers from this complication is the middle finger and thumb [1], and also the index finger and the ring finger have been reported [4]. Both sides of the finger are equally involved [1], besides a fingertip aneurysm was noted. A true aneurysm in the third finger has been described [9]. Pseudo aneurysm of the finger artery is more common than true aneurysm. The most etiologic factor is penetrating trauma [1]. In a patient with palm mass, this diagnosis must be considered [7]. Other differential diagnoses include dermoid cyst, AFV, foreign bodies, ganglia, and neurilemmomas [4]. The hand and fingers injuries are the most common trauma in the body, and the small size of the fingers vessels makes these arteries prone to transection, resulting in thrombosis or aneurysmal damage due to environmental damage [4]. There are some reports in specific situations for finger artery aneurysms;

for example, in the upper extremities of hemophilia patients, arterial aneurysms following catheterization in the forearm have been reported [8,10]. The presence of any mass at the site of the previous catheterization should doubt this diagnosis [10]. Despite aneurysmal rupture not being reported in hand, there is a potential risk of bleeding due to superficial skin damage and aneurysm in daily activity [10]. In most cases, the disease is asymptomatic, and the most common manifestation is an elastic tender mass [11]. A local discomfort sensation is another complaint [4,11], and also ischemic symptoms are rare when one of the fingers arteries is aneurysmal. Strong clinical suspicion is necessary for diagnosis, usually by imaging [7,12-13] (Table 1). Although a definite diagnosis is made during operation or after surgery with pathology (3,14). Treatment aims to eliminate the pain and prevent possible complications (bleeding) [15]. In this study, a patient with a true aneurysm of the finger's artery without trauma history was reported, which is a rare disease.

Case presentation

A 59-year-old patient who is a shopkeeper was attended in a hospital clinic. He had a history of diabetes mellitus, elevated cholesterol, and coronary stenting. The chief complaint was a non-tender mass of the right-hand 4th finger for a year with gradual growth. He did not report any past or recent history of trauma or infectious disease without any familial history
of the aneurysmatic disease. He was asymptomatic except for slight local discomfort when he pressed or pushed something with his hand. He did not have sensitivity or mobility impairment. On clinical examination, a round, soft, pulsatile mass was detected in the lateral aspect of the 4th finger. All peripheral pulses were palpable with no evidence of abnormal or augmented pulsatility or thrill. An ultrasound scan revealed a round mass measuring 15x8mm with high intensity and the pulsatile flow inside and turbulence suggesting aneurysm or related with the proper digital artery. Preoperation angiography was done, and an aneurysm of the finger artery was revealed (Fig. 1,2). He was submitted for resection of the aneurysm under the wrist nerve block. An oblique incision was made, and the aneurysm was disclosed under careful dissection. An aneurysm was excised after proximal and distal control and intravenous heparin injection. The artery was primarily repaired because of weak medial finger artery and prophylaxis of acute ischemia. In the hospital, intravenous separated heparin was injected for two days and discharged by ASA pills. The patient remained asymptomatic with no signs of local recurrence six months after surgery. Histologic examination revealed a saccular aneurysmatic formation surrounded by papillary endothelial hyperplastic lesions.

Figure 1: Finger artery aneurysm by afferent and efferent arteries that explored at operation.

Figure 2:preoperation angiography revealed a giant finger artery aneurysm in the lateral side of the 4th finger and weak medial artery.

Table 1: True finger artery aneurysms that are reported.

Author	Year	Age + gender	Mechanism of injury	Imaging	Location	Presentation	Repair
Lee	2006	44 F	Poor fitting wedding ring	No imaging	Ring finger	Firm, tender, non-pulsatile mass	E + L
Taniguchi	2002	47 M	Radiographer	No imaging	Thumb	mass, no sensory compromise	E + L
Adant	1994	55 M	Metal worker + Haemophilia	No imaging	Thumb	Severe pain and numbness when trying to grasp objects, present for 1.5 years	E + L
Trabulsy	1992	21 F	Telephone operator	No imaging	Index finger	Painful, non-pulsatile mass, loss of sensation, reduced two-point discrimination	E + L
Yoshii	2000	29 M	Golfer	MRI	Ring finger	Non pulsatile, tenderness mass + numbness on ulnar side of finger	E + L
Dangles	1984	46 M	US navy officer + bowler	No imaging	Thumb	Painful mass	E + L
Turner	1984	52 F	Canteen assistant	No imaging	Ring finger	Tender mass, + hypoaesthesia	E + L
Layman	1982	38 M	Crush injury	No imaging	Middle finger	Tender mass + hypoaesthesia, 2 years following injury	E + L
Strauch	2004	32 F	No cause identified	Angiography	5th finger	Fusiform, pulsatile, blue swelling	Excision + reconstruction with IVG
Lanzetta	1992	28 F	Volleyball player	DSA	Middle finger (x3) + Superficial palmar arch	Tender, pulsatile mass + digit 3 degrees cooler than opposite hand	Conservative
Quintella	2019	60 M	No cause identified	MRA	Middle finger	Tender, pulsatile mass	E + L
Dean	2019	13months M	Congenital	Angiography	Second CPDA	Enlarging, pulsatile mass	E + L
Tanaka	2005	2 F	Congenital	Angiography	Middle finger	Pulsatile swelling	Excision + reconstruction with IVG
Vinnivombe	2019	44 M	Musician + Golfer	MRA	Second CPDA	Swelling	E + L
Itoh	1992	8month M	Congenital	USS	Third CPDA	month history of enlarging, pulsating mass	E + L

MRA, magnetic resonance angiography; CTA, CT angiography; MRI, magnetic resonance imaging; USS, Ultrasound scan; DSA, digital subtraction angiography; CPDA, common palmar digital artery; SPBRA, superficial palmar branch of the radial artery; E + L, excision + ligation; E + L + PA, excision + ligation + primary anastomosis; IVG, interposition vein graft.

Discussion

Finger artery aneurysms are rare [1,2,11], and the most common type is false aneurysms. The standard mechanism is penetrating trauma [1]. The reported patient had a true finger artery aneurysm in the forthright hand without correlation to trauma. Indeed, he had a rare type of aneurysm at the non-common finger, which underwent microscopic primary reconstruction to maintain distal blood flow and prevent finger ischemia and its adverse consequences in possible future trauma. True aneurysms are often caused by chronic trauma from exercise or occupation [1,3], although it has been reported due to trauma from the marriage ring. The reported case did not have any history of trauma. Despite the high prevalence of hand trauma, the low prevalence of finger artery aneurysms may be due to the small size of this artery [16]. According to Laplace's law, higher pressure is required to create an aneurysm in small arteries. A low prevalence of aneurysms in these arteries is due to the low pressure inside these arteries [4,17]. Furthermore, repeated trauma weakens the wall of these arteries and explains the mechanism of dilation. It is suggested that a recurrent blunt trauma or vibration is the primary cause of a finger artery aneurysm [2]. The rupture and bleeding from the finger artery aneurysm have not been documented [16]. However, any incision on the palpable mass of the palm without a proper diagnosis may lead to acute bleeding. Every surgeon should know this differential diagnosis to prevent bleeding. In most cases, the disease is initially asymptomatic, and the most common manifestation is an elastic tender mass. Despite the size of these arteries and the risk of thrombosis and spread of intra-aneurysm thrombosis to the distal, most patients complain of pain without any relation to the lumen openness and complain of sudden growth. We had no preoperative signs of ischemia, and after only two days in the hospital, heparin was prescribed and discharged without anticoagulant. Neurosensory disturbance due to pressure and pulsatile mass has been reported in 50% of cases. In irregular cases, thrombosis inside the aneurysm results in non-pulsating mass [1,4]. Some patients complain of local discomfort sensation [3]. Patients do not have ischemic signs in a single artery involvement. Ischemic symptoms Such as coldness, paresthesia, paleness, and lack of pulse are rarely reported [1].

Angiography is the gold standard diagnostic procedure. Magnetic resonance imaging plays a significant role in the diagnosis of finger aneurysms [1]. An Extremity–specific coils in MRI are helpful in definitive diagnosis and rolled out of pathologic lesions [1]. The preoperative use of ultrasound provides an opportunity to operate with more awareness [1]. In some centers, ultrasound is the first diagnostic procedure, and in the absence of ischemia symptoms, Magnetic resonance angiography is performed [8]. A plain X-ray does not help the diagnosis unless the bone involvement [3]. Treatment options include ligation and excision of the aneurysm or reconstruction due to insufficient collaterals [8].

Types of treatment: ligation and excision of the aneurysm or reconstruction due to insufficient collaterals [8]. Reconstruction is indicated when arterial ligation impairs distal blood flow [1], which should be detected in preoperative or intraoperative diagnostic procedures.

The indication for arterial preservation includes the following situations [16].

1-The path is open in angiography

2-Lesions located proximal to the finger

3-Injury in workers who work by hand

4-young people

We aimed to preserve the anatomy as much as possible and avoid the consequences of ischemia in the future.

Conclusion

The finger artery was micro-surgically repaired to maintain distal blood flow and prevent finger ischemia and adverse consequences in possible future trauma. Therefore, a digital artery aneurysm should be role outed with a precise preoperational assessment in every finger mass.

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Conflict of Interest Disclosures

The authors have no conflicts of interest to declare

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Authors' Contributions

All authors involved the preparation of the manuscript.

Ethical Statement

A consent form was signed by the patient and he was aware the treatment procedure.

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