

## Pulsating mass following plain old balloon angioplasty on left anterior descending artery (LAD) via radial access

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### Case Report

#### Abstract

**BACKGROUND:** Trans-radial coronary intervention is a popular technique due to patient comfort and lower complication rate. The main complications of this method are artery spasm, vessel perforation, and formation of pseudo-aneurysm.

**CASE REPORT:** In this report, an unusual complication of radial access angiography was encountered. Shortly after the procedure, the patient's right arm began to swell and a pulsating mass grew over the medial aspect of the arm. Right brachial artery angiography was performed immediately for rolling out brachial artery perforation. There was no evidence of extravasation in brachial angiography. Surprisingly, the mass began to disappear after some active flexion and extension at elbow joint. The same problem occurred again after percutaneous coronary intervention (PCI) on left anterior descending artery (LAD) in this case 2 days later and was resolved by the same maneuver.

**CONCLUSION:** It can be concluded that the brachial artery path was shifted and became entrapped after the procedure due to low soft tissue support.

**Keywords:** Balloon Angioplasty, Percutaneous Coronary Intervention, Brachial Artery

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#### Introduction

Radial and femoral arteries are two common access sites for coronary angioplasty procedures. Easy hemostasis and immediate ambulation after the procedure have made radial access a preferable choice for the intervention of cardiologists among patients. While successful trans-radial technique requires expertise, failure usually occurs due to anatomical variations in the arm.<sup>1</sup> There is notable tendency toward using radial access around the world. While south and Central American countries have lower rates, Malaysia and Norway have the highest rate of radial use. In the Middle East and Africa, the radial access use is infrequent.<sup>2</sup> Artery spasm, bleeding, hematoma, and perforation are among the main complications of trans-radial catheterization, which may occur shortly after or even during the procedure.<sup>2</sup> However, rare presentations may occur during trans-radial catheterization which mimic acute and life threatening complications including hematoma. In this report, a case of brachial artery displacement following plain old balloon angioplasty (POBA) in left anterior descending artery (LAD) via right radial approach is discussed.

#### Case Report

A 70 years old man referred to emergency department of Qaem Hospital, Mashhad, Iran, for rescue PCI with ongoing severe retrosternal chest pain after thrombolytic therapy after anterior myocardial infarction (MI). He had a history of prolonged smoking and consumption of anti-hypertensive drugs. 12-lead electrocardiogram (ECG) showed anterior MI. The patient underwent echocardiography and initial management of acute MI was immediately initiated. Left ventricle ejection fraction was 30% accompanied with severe aortic insufficiency and hypokinetic anterior myocardium as well as mild mitral valve and tricuspid valve regurgitation (pulmonary artery pressure: 39 mmHg). Coronary artery angiography revealed insignificant plaque in left main artery and cut off in LAD, despite normal left circumflex (LCX) and right coronary arteries. Due to severe aortic valve insufficiency, he was candidate for coronary artery bypass graft (CABG) and valve aortic replacement (AVR).

Because of ongoing chest pain, POBA on LAD was performed to reduce pain. POBA was

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performed on LAD by a 2\*15 balloon followed by prolonged dilation with a 3\*20 balloon. Post POBA thrombolysis in myocardial infarction (TIMI) 3 was established in the last view.

After POBA on LAD and withdrawing of guiding catheter, a pulsating mass began to grow on patient's right arm at right brachial artery area. Distal pulses on both upper extremities were symmetrical and there was no sign of distal pallor or cyanosis. Compression along brachial artery began immediately according to possible diagnosis of brachial artery hematoma. The initial diagnosis was brachial artery perforation, so Immediate brachial angiography was performed and no extravasation was seen (Figure 1).



**Figure 1.** Pulsatile mass observed in the right arm (red arrow) after plain old balloon angioplasty (POBA) procedure

The pulsating mass was not resolved after compression for several times. Therefore, vascular surgeon consultation was performed and the patient was transferred to the coronary care unit. Surprisingly, after a few minutes, the mass disappeared when the patient started to use his hand by performing active flexion of the elbow. As the patient refused CABG and aortic valve replacement, PCI on LAD was performed. The follow up for brachial angiography revealed no pathologic finding in right brachial artery (Figures 2 and 3). After a successful PCI, the arm began to swell again and the mass disappeared by flexion and extension of elbow. The patient had an uneventful recovery period and was discharged in healthy condition.



**Figure 2.** Immediate brachial angiography findings: (1) proximal brachial artery angiography, (2) angiography at elbow joint, and (3) angiography below elbow (Bifurcation site)

### Discussion

The radial artery is a good access site for coronary catheterization while its advantages outweighs its complications.<sup>3</sup> This procedure requires expertise and experience in order to avoid possible life threatening complications.<sup>4</sup>



**Figure 3.** Control brachial artery angiography after 24 hours

Hematoma, artery dissection, and artery spasms are among the complications that happen early after the procedure. Among these complications, hematoma and hemorrhage due to artery perforation may manifest as a palpable mass. Hematoma is among the most important complications of catheterizations which require immediate management. They are generally small and may grow in size if left untreated. Most hematomas can be managed by manual pressure. Due to the lack of bleeding at the access site and the observed expanding pulsating swelling in the patient under examination, the most probable diagnosis was an expanding hematoma arising from brachial artery, thus immediate compression along the artery was performed to prevent compartment syndrome.<sup>3</sup> Due to the unsuccessful artery compression and lack of signs of distal ischemia or discoloration, it was decided to observe the patient

and plan a vascular surgeon consultation. During preparation of the patient, the pulsating mass disappeared after performing active flexion and extension maneuvers in the elbow and possible diagnosis of hematoma or hemorrhage was ruled out. It was then hypothesized that the patient had an anatomical variation in arm muscles and wire and catheter passing manipulated the brachial artery root around cubital fossa.

Biceps muscle is the most common muscle of the arm and shoulder which has accessory heads.<sup>5</sup> The insertion site of biceps tendons are mostly separated and in a quarter of cases are bifurcated. Neurovascular structures may be entrapped in accessory muscles attached to the elbow.<sup>6</sup> In some cases, the humeral head of the pronator teres has an abnormally high attachment to a bony spur raised from distal portion of humerus. In such cases, the distal portion of brachial artery may be entrapped behind the humeral head of pronator teres.<sup>7</sup> Meda et al. reported a case of brachial artery entrapment syndrome due to supracondylar spur.<sup>7</sup> Regarding the patient in this study, no bony lesion was observed on the humerus neither in palpation nor in X-ray. Moreover, no signs of ischemia or abnormal neurological examinations were observed in this patient. Another differential diagnosis of palpable mass in arm is brachial artery aneurysm. Tetik et al.<sup>8</sup> reported a case of brachial artery aneurysm in a 50 year old woman who was presented with a swollen and pulsatile mass in right arm with symmetrical pulses in both hands. Although the patient in this study did not have any history of trauma or other iatrogenic causes of pseudo aneurysm, they decided to operatively repair the true aneurysm. The hypothesis in the current study is the shift of brachial artery from its location due to severe low soft tissue support.

Catheterization via radial access is usually an uncomplicated procedure. However some anatomical variations may complicate this technique. In the present case, an anatomical variation in adjacent tissues caused acute dislocation of brachial artery.

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### Conflict of Interests

Authors have no conflict of interests.

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