Dermatology Case Reports

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Palpable Radial Pulse Despite Artery Occlusion - How is that Possible? A Localized Livedo Racemosa Leads to the Solution

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Abstract

This case report highlights the diagnostic value of livedo racemosa as a clinical clue for radial artery occlusion. Given the increasing use of radial atrial cannulation in clinical routine, this clue may be of importance for clinicians.

Keywords: Livedo racemosa; Radial artery occlusion; Arterial cannulation

Introduction

Transradial cannulation is the most common site for arterial approach [1-4]. Among other complications this procedure bears the risk of radial artery occlusion (RAO), which is commonly thought to be indicated by an absent radial pulse [5-8]. Livedo racemosa (LR) is a distinct pattern of livedo reticularis due to alterations in blood flow through the cutaneous microvasculature system. It is characterized by a large branching pattern of irregular open segments resulting from accumulated deoxygenated blood in the venous plexus. LR is typically seen in panarteriitis nodosa or Sneddon's syndrome but may also appear in polyglobulia, cryoglobulinemia or other conditions leading to partial thrombotic occlusion of small vessels.

History

A 50-year-old female patient was hospitalized for subarachnoidal hemorrhage and symptomatic vasospasm of the left median cerebral artery. A radial catheter on the right side was used for cerebral angiography and low dose lidocain was applied to treat the vasospasm. The catheter was then left in place for monitoring, physiological sodium chloride solution kept it open. No other medication was given through the catheter and no other catheters were set. A few hours after the catheter was removed, the forearm showed a figurate erythema.

Clinical Presentation and Findings

During the following 2 days the erythema on the right forearm turned into a livid reticular pattern with irregularly broken circles consistent with LR. Both forearm and hand were warm, swollen but not painful. The radial and ulnar pulses were well palpable (Figure 1), time to recapillarisation on the fingertips was normal. Due to persistence of the LR over 2 days, an impaired perfusion of the radial artery (or of one of its branches) was postulated despite the palpable pulse. Duplex sonography confirmed a 6 centimeter long occlusion of the radial artery explaining the LR (Figure 2a). Distal to the occlusion, a retrograde flow in the radial artery was detectable, indicated by the blue colour sign and the flow below the baseline (Figure 2b).

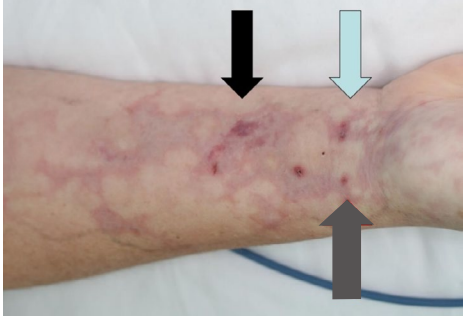

Figure 1: Palpable radial pulse (grey arrow) and ulnar pulse (white arrow) in the area of the punctures. The centrally located hematoma (black arrow) might be due to capillary fragility in critical ischemia or due the puncture procedure.

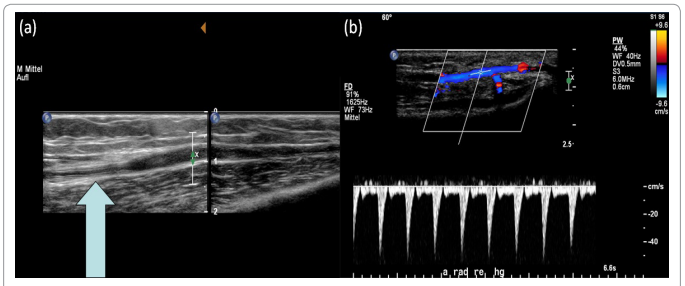

Figure 2: (a) Occlusion of the radial artery **(b)** Retrograde flow in the distal radial artery.

Outcomes

After the diagnosis of the radial artery occlusion (RAO), therapeutic anticoagulation with unfractionated heparin was started. Six days later the swelling had disappeared, the LR was fading and regression of the occlusion was confirmed by duplex sonography. Both the radial and ulnar pulse remained palpable in the follow-up.

Discussion

According to a recent systematic review and meta-analysis, RAO in trans-radial interventions were found with an overall incidence of 7.7% up to 24 hours and 5.8% at up to 30 days. It was therefore termed «The Achilles' heel of trans-radial technique» [9,10]. Our case exemplifies, that a present radial pulse does not exclude RAO, which is often clinically silent and therefore overlooked.

In fact, in a duplex controlled study, only 20% of patients with RAO

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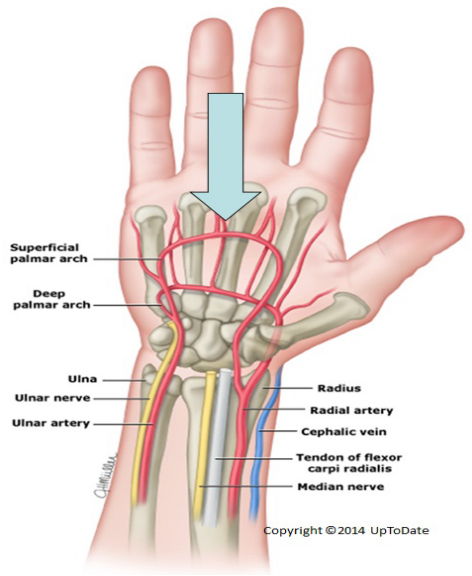

Figure 3: Arcus palmaris.

had no palpable pulse. As the arcus palmaris (Figure 3) connects the radial artery to the ulnar artery, a «radial» pulse may be palpable due to this dual supply. Hence, the arcus palmaris guarantees retrograde perfusion of the hand either the radial or the ulnar artery is closed. Thus, the diagnosis of RAO should not depend on the presence or absence of a radial pulse. In our patient LR was the only, but decision-making clinical sign of the RAO. This case shows that a livedo around or close to the cannulation site can be a clinical clue for RAO and should raise clinical suspicion. To the best of our knowledge, this is the first report in respect thereof. However, it can be hypothesised that similar cases can be observed in clinical routine, but may be missed due to the present radial pulse (especially by physicians unaware of the dual blood supply), a concomitant (often seen) access site hematoma or because non-dermatologists may not recognise a slight livedo as a cutaneous sign of vascular occlusion. This assumption is supported by reports that RAO is also overlooked because of a lack of clinical assessment [11]. However, RAO is not just a benign complication as the future use of the radial artery for percutaneous coronary intervention, bypass graft and for haemodialysis access may be precluded and severe complications such as hand ischemia or necrosis can occur [12,13]. Therefore, clinical clues pointing to RAO should be known by clinicians involved in patients with radial cannulation in order to expedite diagnosis and timely initiate anticoagulation to minimize further thrombosis/embolization or even intra-arterial thrombolysis as an attempt to restore artery patency.

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