SHORT REPORT

Acute Upper Limb Ischemia in Patient with Aberrant Radial Artery

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Acute limb ischemia; Angiography; Arterial variation; Radial artery; Vascular surgery

Abstract
Upper limb arterial variations are frequently discovered at cadaver dissection, in clinical or surgical settings. We report the case of a female patient with acute upper limb ischemia due to a thrombosed brachial artery. At operation, an aberrant radial artery (ARA) was found, resembling the brachial artery. Further identification of the brachial artery deep to ARA leads to successful revascularization.

Introduction
Anatomical variations in the upper limb arteries are described mostly during anatomical, ultrasound or angiographic studies or incidentally during surgery, being a potential source of caveats and errors. We report the case of a patient with acute upper limb ischemia, having an aberrant radial artery that could have been easily mistaken for a thrombosed brachial artery, and describe the particular intra-operative pitfalls and difficulties.

Case report
An 84-year-old female patient was admitted with acute right upper limb ischemia. Associated diseases included non-insulin dependent diabetes mellitus, arterial hypertension and chronic ischemic heart disease. The patient was in sinus rhythm. The physical and Doppler examinations revealed extensive brachial artery thrombosis with no demonstrable collateral or distal flow. At operation, an artery resembling the brachial artery was dissected: the artery was located deep to the bicipital aponeurosis, had two venae commitantes, crossed the region obliquely and bifurcated, giving the impression to generate the radial and ulnar branches. However, the artery appeared slender (3 mm diameter), more superficial (than the medial epicondylar muscle mass) and was not accompanied by the median nerve. Distal thrombectomy was successful but the artery was occluded proximally. No inflow could be restored. The aspect and anatomical relations of this vessel suggested the possibility of the existence of an aberrant radial artery (ARA). Deeper dissection revealed a normally-located brachial artery (BA), of normal caliber (5 mm diameter), and the accompanying median nerve. Both...
arteries showed extensive atherosclerotic lesions. However, distal and proximal brachial artery thrombectomy was successful obtaining a good inflow and runoff. The postoperative course was uneventful and the patient was discharged on oral anticoagulant therapy with a palpable distal pulse. Completion angiogram (Fig. 1) demonstrated the ARA originating from the proximal BA, running superficial to the BA occluding after a few centimeters being refilled through collateral circulation at cubital level. The ARA crossed the BA and traveled as a normal radial artery in the forearm and hand, with a normal distal distribution. The BA showed a normal course, eventually giving off the ulnar and the interosseous arteries. The ulnar artery had a limited occlusion in the distal forearm compensated by retrograde filling (through the palmar arches).

Discussion

High origin of the radial artery from the BA was the most frequent variation encountered in human embryos, adult cadavers and in angiographic studies. Bilateral cases have been described. The ARA may arise as a single trunk from the axillary—brachial axis or having a common origin with other branches such as the lateral thoracic and thoracodorsal arteries.

ARAs may be encountered as isolated variations or in the context of multiple arterial, osteo-muscular and neural anomalies. ARA may also occur in the context of absent deep brachial artery; it may replace the normal radial artery or it may occur as an accessory radial artery.

The case hereby reported reflects some of the difficulties and pitfalls the surgeon might face: the ARA could have been easily mistaken for a slender and diseased BA. Without further dissection and identification of the brachial—ulnar trunk the evolution of the patient would have been dismal. A preoperative diagnosis of this arterial variation would have been unlikely as in such cases, with extensive arterial thrombosis, angiographic interrogation or Doppler examination offer little information on the distal vascular bed and on the potential presence of incidental variations and anomalies.

Upper limb arterial variations are fairly abundant, having long received the attention of anatomists. However, the diagnostic and surgical implications make the study of these cases more relevant for the clinician.

References