Recurrent upper limb ischaemia due to a crutch-induced brachial artery aneurysm

Kouji Furukawa*, Takahiro Hayase and Mitsuhiro Yano

Department of Cardiovascular Surgery, Miyazaki Medical Association Hospital, Miyazaki, Japan

* Corresponding author. Department of Cardiovascular Surgery, Miyazaki Medical Association Hospital, 738-1 Funato, Shinbeppu-cho, Miyazaki 880-0834, Japan. Tel: +81-985-249119; fax: +81-985-232210; e-mail: furuk@cure.or.jp (K. Furukawa).

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Abstract

An 83-year old man who had used bilateral axillary crutches for 67 years was referred to our hospital for acute left upper limb ischaemia. He underwent successful recanalization through emergent catheter thromboembolectomy. However, a crutch-induced left brachial artery aneurysm was subsequently detected by computed tomography. Therefore, we performed aneurysm exclusion and subsequent saphenous vein bypass grafting. When a crutch user presents with upper limb ischaemia, a high index of suspicion and early identification of the crutch induced vascular injury are mandatory for appropriate treatment.

Keywords: Crutch-induced vascular injury • Brachial artery aneurysm • Upper limb ischaemia

INTRODUCTION

Crutch-induced vascular injury (CVI) is rare, but it constitutes a major source of acute or chronic upper limb ischaemia in crutch users. Moreover, it results in several clinical features that are distinct from those presented by other upper limb ischaemia sources. Here, we report the case of a patient who presented with recurrent left upper limb ischaemia due to a crutch-induced brachial artery aneurysm and was treated through surgery.

CASE REPORT

An 83-year old man with a diagnosis of acute left upper limb ischaemia was referred to our hospital. He had used bilateral axillary crutches for the past 67 years due to left lower limb amputation following severe limb trauma from a gunshot wound sustained during the war. During the 5-year period prior to this admission, the patient had undergone an embolectomy and had received thrombolytic therapy twice due to recurrent left brachial artery thromboembolism. On his first ischaemic episode, an arteriogram showed dilatation of the left brachial artery, and he was advised not to use axillary crutches. However, he had continued to regularly use them as a walking aid. Upon admission, his left forearm and hand were cold and pale, left brachial and arm pulses were absent and he had a weak grip and paraesthesia. Heart sounds were normal with no heart murmur, and both an electrocardiogram and an echocardiogram were normal. However, vascular ultrasound showed an occlusion of the left brachial artery, and the patient underwent successful recanalization through emergent catheter thromboembolectomy. A brachial artery aneurysm was suspected based on arteriogram findings, and computed tomography (CT) was then performed. Consequently, a 25-mm left brachial artery aneurysm with intraluminal thrombus was detected (Fig. 1A and B). Aneurysm exclusion and subsequent saphenous vein bypass grafting positioned subcutaneously were performed. Postoperative CT confirmed that the aneurysm had completely clotted and the graft was patent without evidence of thrombosis (Fig. 2A and B). The patient’s motor weakness and sensory disturbance gradually improved; he was trained to use elbow-supporting crutches and was transferred to another rehabilitation hospital.

DISCUSSION

Upper limb ischaemia is most often caused by emboli of cardiac origin. Rare causes of upper limb emboli include thoracic outlet syndrome and proximal subclavian artery aneurysms [1]. As demonstrated by the present case, wherein a patient who has used crutches presents with acute or chronic upper limb ischaemia, CVI should be suspected [2–4].

CVI results from the inappropriate placement of the patient’s body weight on the axillary pad of the crutch device [2]. This repetitive blunt trauma causes disruption and degeneration of the tunica intima and tunica media, which could lead to the formation of an aneurysm or a stenosis, while intimal disruption could lead to thrombogenesis [3, 4]. Aneurysms resulting from CVI are much more frequently accompanied by intraluminal thrombus than other types of aneurysms; the loose thrombus may become dislodged upon further trauma from using the crutches and may form an acute, chronic or repetitive embolism [4]. Most of the patients with CVI have used crutches for >30 years [4]. However, a patient who had only been using crutches for 2 months reportedly presented with CVI as well [2].
CVI most commonly presents as sudden ischaemia of the upper limb [2, 3], and it is much more frequently associated with recurrent embolism than other upper limb embolism sources [4]. Moreover, the long-term prognosis of patients with CVI can be much poorer than that of patients with other upper limb embolism sources, since showers of small emboli dislodged due to repetitive trauma could gradually occlude distal vessels and may compromise the results of revascularization during a later ischaemic episode [2–4]. Indeed, a 10% amputation rate has been reported in patients with CVI, compared with a 0–4% rate in patients with upper limb embolism, in general [4].

When a crutch user presents with upper limb ischaemia, a high index of suspicion and early identification of CVI are mandatory [2–4]. During the initial management of acute limb ischaemia, either catheter-directed thrombolysis or surgical treatment may be considered for recanalization as early as possible [3]. After recanalization, aneurysms should be treated with surgery that involves aneurysm resection and reconstruction with a suitable graft, or aneurysm exclusion with subsequent bypass grafting. In the present case, we chose the latter method to prevent injury to the median nerve, since the aneurysm was relatively large. However, it is important to note that such an
operation is prone to recurrence and rupture due to rich collateral circulation in the shoulder area [4], and a graft positioned subcutaneously is susceptible to further trauma. In light of the present case findings, we believe that all efforts should be made to eliminate axillary pressure, and surgical treatment should be considered even if it is asymptomatic.

Conflict of interest: none declared.

REFERENCES