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Dog Bite Causing Ischemia and Neurological Deficit at the Upper Extremity: A Case Report

Köpek Isırığı Nedeniyle Üst Ekstremitede Oluşan Nörolojik Defisit ve İskemi: Olgu Sunumu

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ABSTRACT

We present a case with median and radial nerve injuries together with brachial artery occlusion after a dog bite that is seen rarely in the literature. A 26 year-old man was admitted to our emergency department with a complaint of dog bite and weakness of fingers at the left upper extremity. There were bite impressions at the left arm. The physical examination of the patient revealed no brachial and radial artery pulse. The neurological examination revealed radial and median nerve deficits. The patient underwent a thromboembolectomy operation following laboratory and radiological evaluations. The nerve injuries were evaluated as partial and medical treatment was administered.

KEY WORDS: Brachial artery occlusion, Dog bite, Radial and median nerve injury

ÖZ

Köpek ısırığı nedeniyle brakial arter tıkanıklığı, radial ve median arter yaralanması olan ve literatürde oldukça nadir görülen olguyu sunduk. 26 yaşında erkek hasta köpek ısırığı nedeniyle sol üst ekstremitede parmaklarda kuvvet kaybı gelişmesi üzerine acil servise müracaat etti. Fizik muayenesinde sol kolda üç adet ısırık izi ve brakial, radial arterde nabız alınamıyordu. Nörolojik muayene sonucu radial ve median sinir hasarı olarak değerlendirildi. Laboratuvar ve radyolojik değerlendirmelerden sonra hastaya tromboembolektomi operasyonu uygulandı. Sinir yaralanmaları parsiyel olarak değerlendirilerek medikal tedavi uygulandı.

ANAHTAR SÖZCÜKLER: Brakial arter tıkanıklığı, Köpek ısırığı, Radial ve median sinir hasarı

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INTRODUCTION

The basic etiologies of nerve and vessel injury at the upper extremity are incisive and penetrative tool injury, broken bone and dislocations, traffic accident, firearm injuries and crush trauma. Brachial artery or vein and ulnar nerve injury can accompany median nerve injury at the upper arm region due to the proximity of the neurovascular structures (2). The most common nerve injury at the upper extremity is of the radial nerve (1). Arterial injuries after trauma may be classified as complete transection, laceration, trombosis with contusion, intimal flap, false aneurysm, and arteriovenous (AV) fistula (7). The most common arterial injury is complete transection or laceration. Additionally, thrombosis or arteriovenous fistulas are seen rarely (7).

Our case had median and radial nerve injury together with brachial artery occlusion. There are many reports of artery and nerve injury at the extremity after trauma. We believe that median and radial nerve injury together with brachial artery occlusion after a dog bite make our case interesting. We present this case as it is a rarely seen type of injury.

CASE REPORT

A 26-year-old man was admitted to our emergency department after a dog bite. The physical examination of the patient revealed dog bite impressions at the medial and lateral side of the left upper extremity (Figure 1). Rabies vaccine was administered to the patient and the dog bite region washed with soap and water. The neurological examination revealed paresthesias of the first 3 fingers, weakness of hand grip and pronation, inability to perform the ''ok'' sign (because the thumb and forefinger could not be pinched together effectively), and 2/5 motor force for the extension of wrist and fingers of the left upper extremity. We could not detect the pulses of the radial and brachial arteries during the physical examination. Doppler ultrasonography of the left upper extremity showed a thrombus at the medial segment of the brachial artery and magnetic resonance angiography (MRA) revealed an embolus at the upper elbow part of the brachial artery just below the dog bite region (Figure 2).

We planned to use medical therapy for the radial and median nerve injury and surgery for the acute occlusion of the brachial artery. A left median incision was performed to the left arm and the

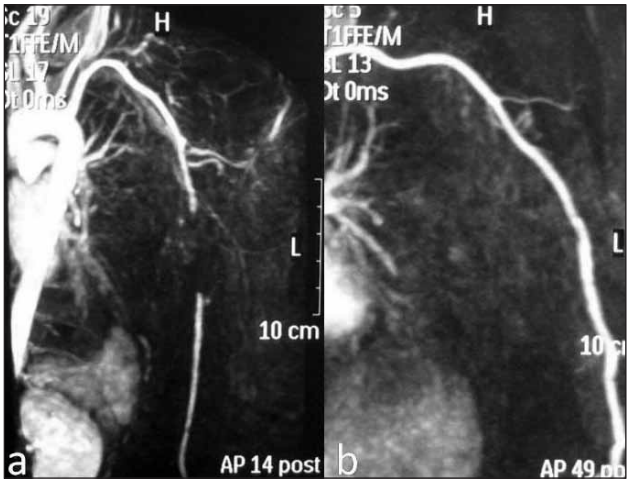

Figure 2: *The preoperative and postoperative MRA images of the left brachial artery.*

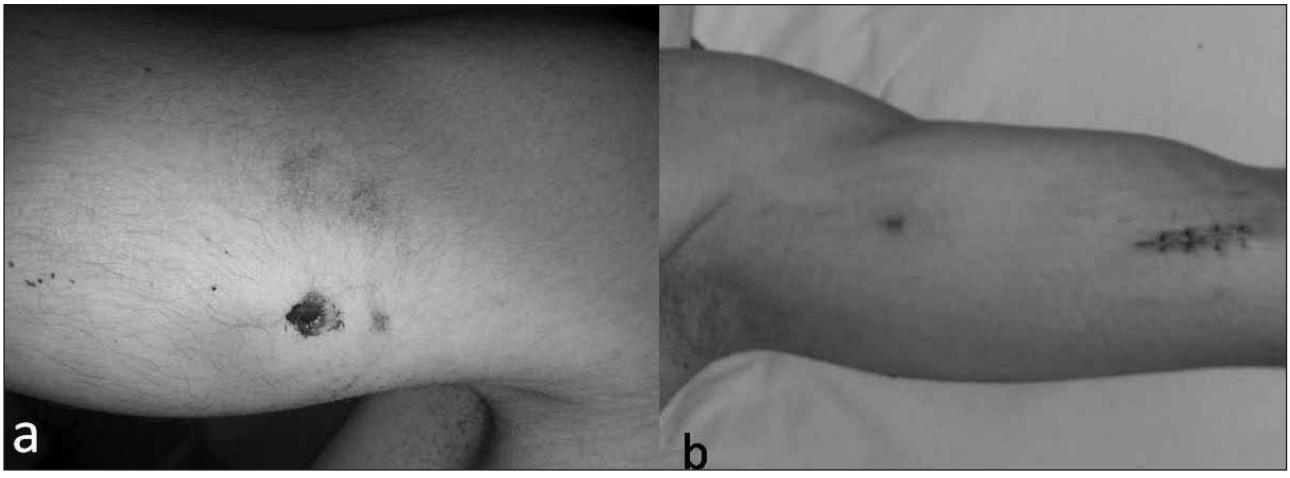

Figure 1: *The preoperative and postoperative images of the dog bite and incision..*

brachial artery was exposed. Thromboembolectomy was performed as the brachial artery was thrombosed (Figure 1). The flow of blood was achieved from proximal to distal brachial artery. The brachial and radial artery pulse was detected postoperatively. The follow-up MRA of the patient two weeks after operation showed flow at the brachial artery (Figure 2). The electromyography (EMG) of the patient 3 weeks after operation revealed denervation at the left radial nerve-innervated forearm extensor muscles and left median nerve-innervated abductor pollicis brevis muscles. The neurological signs of the patient had improved two months after the operation.

DISCUSSION

The ulnar nerve is reported to be the most important nerve at the upper extremity (4). Additionally, it is also declared that ulnar nerve injury is less common than radial and median nerve injury (2). Tuncali et al. reported the classification of upper extremity nerve injuries according to their localization in 2004 (6). They stated that nerve injury is seen rarely at the arm region and injury of the median and radial nerves together was seen in one of 134 nerve injury cases. They also reported one brachial artery injury accompanying the 24 median nerve injuries (6). The study of Zellweger et al. in 2004 reported that the majority of brachial artery injuries are due to incisive tools and firearm injuries (7). Other possible causes of brachial artery injury are dog bite, traffic accidents, and blunt trauma (3).

The brachial artery is divided to three parts as the proximal, middle and distal parts to evaluate the injuries. The frequency of injury is equal in the three parts of the brachial artery but accompanying nerve injury such as median and radial nerve is less common with injury of the middle part (7). Arterial injuries due to trauma are classified as transection, laceration, thrombosis, intimal flap, false aneurysm and AV fistula (7). The study of Zellweger et al. found 6 thromboses in 75 cases due to distal contusion injury (7). The only brachial artery occlusion case after dog bite in the literature was reported by Toshifumi in 2004 (5).

We believe that our case of brachial artery occlusion together with median and radial nerve injury after a dog bite is the unique in the literature. We present this case to contribute to the literature especially on the care of nerve and artery injuries after dog bite.

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