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Case Report
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Tortuous External Iliac Artery Siphon, Entrapping the Obturator Nerve

Latha V. Prabhu[1], Ashwin R. Rai[1], Rajanigandha Vadgaonkar[1], Mangala M. Pai[1], B.V. Murlimanju[1]

[1]Department of Anatomy, Kasturba Medical College, Mangalore, Manipal Academy of Higher Education, Manipal, Karnataka, India

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ABSTRACT

Introduction: we report a case of tortuous external iliac artery (EIA), which was compressing the obturator nerve. This was observed over the left side in an embalmed male cadaver, of approximately 70-year age individual. The EIA was mimicking a siphon and this siphon was compressing the structures entering the obturator canal, particularly the obturator nerve. It was observed that the EIA was thicker and harder than the usual. The observation of EIA of the right side did not reveal any tortuosity. The tortuous EIA compressing the obturator nerve as in this case may cause symptoms like pain and tingling sensation, numbness in the hip and knee joints. In addition, this may lead to adductor muscles weakness. Such neurovascular compression as seen in this present case are noteworthy especially with procedures concerned with the obturator nerve block. The knowledge of tortuous EIA is enlightening to the cardiologist during the procedures like catheterization and implanting the endografts.

Keywords: Arteries; Obturator Nerve; Nerve Compression Syndromes.

Introduction

The causes of groin pain include inflammation of the tendon and bursa, stress fracture, pubic bone inflammation and sports hernia. On some occasions, the cause may be a nerve entrapment.[1,2] Entrapment of obturator nerve is difficult to evaluate, as the mononeuropathy of it is extremely rare. Obturator nerve entrapment, particularly its anterior division has been reported and this was relieved by the surgical decompression.[3] The obturator nerve is a branch of lumbar plexus which is formed within the psoas muscle and appears medial to the same in the posterior abdominal wall. It runs antero-inferiorly in the true pelvis traversing the lateral wall -before entering the foramen obturatum. Obturator nerve has anterior and posterior divisions, which are given inside the obturator foramen. The anterior division provides motor supply to gracilis, adductor longus and adductor brevis muscles in the medial compartment of the thigh. It also provides sensory supply to the adductor compartment. The posterior division of obturator nerve innervates the obturator externus and adductor part of adductor magnus muscles. The posterior division also innervates the knee joint.[3] On few occasions, the posterior division instead of anterior supplies the adductor brevis.[4,5]

The common iliac artery bifurcates into external and internal iliac arteries. The internal iliac artery supplies the pelvis and external iliac artery (EIA) is continued as femoral artery, which supplies the lower extremity. It was reported that EIA variations are extremely rare.[6] There are few cases of obturator nerve entrapment reported in the literature and the same stands true for the tortuosity of EIA in Indian literature. In this case, the tortuous EIA was compressing the obturator nerve just before the obturator canal.

Case Report

During the dissection of pelvic region over the left side in an embalmed male cadaver (Fig. 1), of approximately 70-year age individual, it was observed that EIA was tortuous and mimicking a siphon (Fig. 1). This EIA was having 'S' shape and this siphon in the pelvis was compressing the structures entering the obturator canal, particularly the obturator nerve (Fig. 1). The obturator vessels were observed to be medial to the obturator nerve. The obturator nerve was being compressed before entering the obturator foramen, so nerve fibers of both of its divisions were compressed. During palpation, it was noticed that, this tortuous artery was thicker and harder than the usual. The external iliac vein was observed to be medial to the EIA. There was no tortuosity over the right sided EIA or any other arteries in the body of this cadaver.

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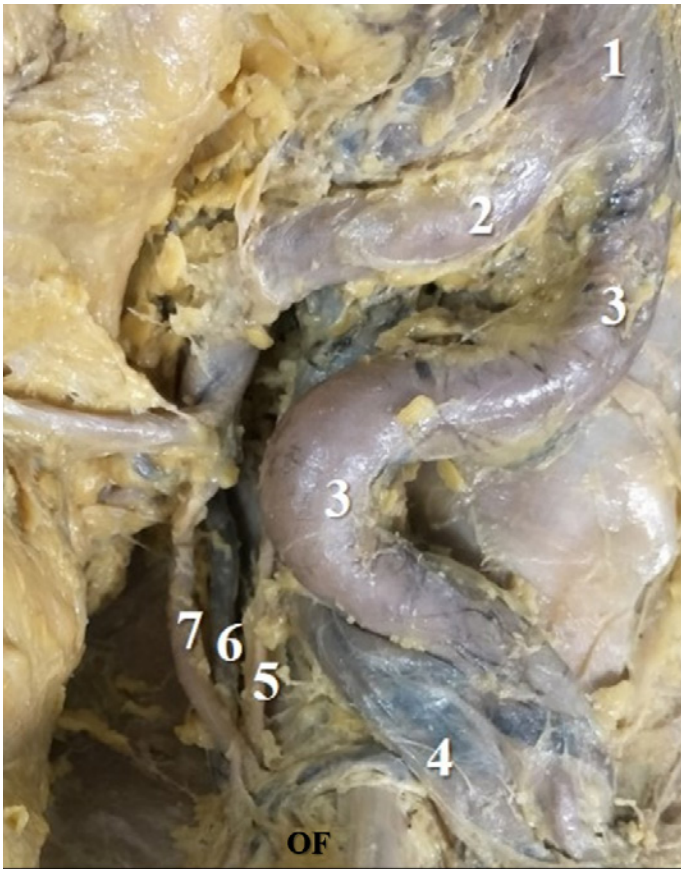

Figure 1. Cadaveric specimen showing the tortuous EIA compressing the obturator nerve (1- common iliac artery; 2- internal iliac artery; 3- EIA; 4- external iliac vein; 5- obturator nerve; 6- obturator vein; 7- obturator artery; OF-obturator foramen).

Discussion

Tortuosity is the abnormal twists and turns of the vessel. da Vinci[7] initially reported the vascular tortuosity in his anatomical drawings. He reported that superficial vessels of the arm in the old people were tortuous and in the young, they were straight. Arterial tortuosity is due to variation in the vascular elongation and this may be due to a redundant vascular route during the primary arteriogenesis or the skeletal changes of senescence.[8] The discrepancy between the arterial lengthening and growth of surrounding anatomic structures during the childhood can lead to tortuosity.[9] Arteries are usually straight vessels, which transmit oxygenated blood to the organs and body parts. On rare occasions, arteries can be tortuous because of abnormal development or vascular pathology.[10] Clinical studies have related tortuous arteries into aging process, atherosclerosis, diabetes mellitus, hypertension and genetic defects.[10] However, it was reported that the morphogenesis of tortuous vessels is not clearly understood.

There were 4 major types of tortuous EIA reported, which include S-shape, reverse C shape, low grade shape and V-shape.[11] The present case belongs to 'S' shape of tortuous EIA. The tortuosity may be due to the excessive length of an artery and no availability of space. It is also possible that this could be also due to pathological changes, such as atherosclerosis. Angiography is the essential investigation performed in the peripheral vascular diseases. Anatomists and surgeons have studied anatomical variations of the arteries of lower limbs.[12] It was reported that the unusual vessels are a matter of concern to the orthopaedicians, urologists, gynaecologists and general surgeons.[13] The knowledge of tortuosity of EIA is important during the total hip replacement and other pelvic surgeries.[6] The tortuous EIA may cause complications during the prostatectomy surgery as well. Moul *et al.*[14] reported a larger loop of EIA causing difficulty in performing the radical retropubic prostatectomy. Insertion of endografts in the tortuous arteries is often problematic and challenging.[15] Tortuous EIA compressing the obturator nerve as in this case may lead to clinical symptoms ranging from mere topical skin changes to ischemic pain. Here the obturator nerve was compressed before entering the obturator canal thereby decreasing the power of adductors.

The tortuosity of EIA should be explained to the medical students, as this will give them some insight into the anatomical variation, vascular pathology and surgery. This kind of tortuousity can compress all the structures at the obturator foramen, which include obturator nerve, obturator artery and obturator vein respectively. The tortuosity can alter the vascular dynamics, which can lead to thrombus and emboli formation. These have consequences like intermittent claudication in the lower extremity due to ischemia. In females, the tortuous artery can compress the pelvic viscera like the ovary and uterine tube. We believe that, reporting of such a rare arterial variation of the vessel is enlightening to the pelvic surgeon, orthopaedician and gynecologist. The knowledge is also important in understanding the etiopathogenesis of peripheral vascular disease resulting in intermittent claudication. The information about the neurovascular compression because of this tortuous EIA is also noteworthy during the obturator nerve block.

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Corresponding author
B.V. Murlimanju
E-mail: flutemist@gmail.com