Case Report:

An anomalous origin of obturator artery: A case report

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Abstract:
The obturator artery normally arises from the anterior trunk of internal iliac artery. Variations in its origin and course has drawn attention of surgeons, anatomists and radiologists. The literature contains many articles that report variable origins. Interesting variations in the origin and course of the principal arteries have long attracted the attention of anatomists and surgeons. A case of abnormal origin of obturator artery was observed in a 55-year-old male cadaver, while doing routine dissection for first year MBBS students in Kasturba Medical College, Manipal. The artery was arising from the inferior epigastric artery close to its origin from external iliac artery. The artery later crossed the external iliac vein and accompanied the obturator nerve and vein to enter the obturator canal. General surgeons dealing with laparoscopic herniorrhaphy should be aware of the aberrant obturator artery.

Keywords: Internal iliac artery, obturator artery, abnormal obturator artery, obturator foramen

Introduction

Obturator artery is one of the medium sized parietal branches of the anterior division of internal iliac artery. It inclines antero-inferiorly on the lateral pelvic wall and leaves the pelvic cavity by passing through the obturator foramen. It supplies the medial side of the thigh. It is the most variable vessel among the branches of the internal iliac artery\(^1\). The obturator artery is more variable and arises as a direct branch from the anterior division of internal iliac artery in 41.4\% of instances, from the inferior epigastric artery in 19.5\%, from the superior gluteal artery in 10\%, from the inferior gluteal-internal pudendal trunk in 10\% and by a double origin in 6.4\%. In only 23\% of instances is a similar origin noted on both sides\(^2\). In 20-30\% of subjects the obturator artery is replaced by an enlarged pubic branch of the inferior epigastric artery, which is called abnormal obturator artery. It descends almost vertically to the obturator foramen. It is usually near the external iliac vein, lateral to the femoral ring, and is then safe in herniotomy. Sometimes it curves along the edge of the lacunar part of the inguinal ligament, partly encircling the neck of a hernia sac, and may be inadvertently cut during enlargement of the femoral ring in reducing a femoral hernia\(^3\).

The anomalous obturator vessels and inferior epigastric artery may be in a dangerous situation in pelvic surgeries that require dissection or suturing along the pelvic rim\(^4\).

Case Report

A case of abnormal origin of obturator artery was observed in a 55-year-old male cadaver, while doing routine dissection for first year MBBS students in Kasturba Medical College, Manipal. The artery was arising from the inferior epigastric artery close to its
origin from external iliac artery as shown in Fig 1. The artery crossed the external iliac vein and descended vertically downwards to the obturator foramen. It accompanied the obturator nerve and vein to enter the obturator canal as shown in Fig 2.

Discussion
The obturator artery gives off a small branch to the periostuem on the back of the pubic bone, which anastomoses with the pubic branch of the inferior epigastric artery. In over a third of cases this anastomotic connection opens up and no obturator artery arises from the internal iliac artery. Such replacement by the branch from the inferior epigastric artery is named the “abnormal obturator artery”. Obturator artery is variable in its origin. It may arise from the common iliac, anterior division of the internal iliac (41.4%), inferior epigastric (25%), superior gluteal (10%), inferior gluteal-internal pudendal trunk (10%), inferior gluteal (4.7%), internal pudendal (3.8%) or external iliac (1.1%) \(^5\).

A study done by Pavan et al, obturator artery presents considerable variation in its origin. It took origin most frequently from the anterior division of the internal iliac artery in 36 specimens (72%). Out of which, directly from anterior division in 20 specimens (40%), with ilio-lumbar artery in 5 specimens (10%), with inferior gluteal artery in 3 specimens (6%), with inferior vesical artery in 2 specimens (4%), with middle rectal artery in 1 specimen (2%), with internal pudendal artery in 4 specimens (8%) and with uterine artery in 1 specimen (2%). The obturator artery too origin from the posterior division of internal iliac artery in 9 specimens (18%), from external iliac artery in 1 specimen (2%), from inferior epigastric artery in 3 specimens (6%) and was found to be absent in 1 specimen (2%) \(^5\).

The embryological explanations for the anomalies in the arterial patterns of the limbs are based on an unusual selection of channels from a primary capillary plexus, wherein the most appropriate channels enlarge while others retract and disappear, thereby establishing the final arterial pattern \(^7,8\). The OA arises comparatively late in development as a supply to a plexus, which in turn is joined by the axial artery of the lower limb that accompanies the sciatic nerve \(^9\).

In cases of ligation of the internal iliac arteries and their branches in women undergoing pelvic surgery, as well as in cases of obstruction of the internal iliac artery due to any cause, the OA and its branches will be spared, especially the branch to the head of femur, when the obturator artery arises from the external iliac artery. General surgeons dealing with laparoscopic herniorrhaphy should be aware of the aberrant obturator artery that crosses the superior pubic ramus and is susceptible to injuries during dissection of the Bogros space and mesh stapling onto Cooper’s ligament \(^10\).

The superior border of the iliopubic ramus is an area of considerable concern for a variety of surgical specialists, as it serves as an anchoring site for inguinal and femoral hernia repairs. Surgeons operating on the lower abdomen and pelvis often retract the abdominal muscles laterally placing pressure on the lateral pelvic walls. Thus, a complete understanding of anatomy of this area is critical \(^4\). The relevance of this paper is to draw attention of those engaged in interventional maneuver into human pelvis, as a variant obturator vessel can be inadvertently cut results in very serious complications.
Figure 1 showing origin of obturator artery from the inferior epigastric artery.
[IIA-Internal iliac artery, EIA-External iliac artery, AOA- Abnormal obturator artery, IEA- Inferior epigastric artery]

Figure 2 showing the abnormal obturator artery entering the obturator canal.
[IIA-Internal iliac artery, EIA-External iliac artery, AOA- Abnormal obturator artery, IEA- Inferior epigastric artery]

References