

# Multiple vessel variations in the retropubic region

Levent Sarikcioglu, Muzaffer Sindel

Department of Anatomy, Akdeniz University Faculty of Medicine, Antalya-Turkey

[Received 1 August 2001; Revised 3 December 2001; Accepted 19 December 2001]

*We encountered some multiple vessel variations in the retropubic region of a 55-year-old male cadaver. The obturator artery had its origin from the external iliac artery, and inferior epigastric artery from the femoral artery. Additionally, an anastomosis between obturator and inferior epigastric veins (venous Crown of death) was observed.*

**key words:** obturator artery, vessel variations

## INTRODUCTION

The obturator artery and vein are usually described as branches or tributaries of the internal iliac vessels, although variations with connections to the external iliac or inferior epigastric vessels have been reported [4]. Origination of the obturator artery directly from the external iliac artery was reported at 1.1% by Bergman et al. [1], 25% by Missankov et al. [7], 1.3% by Jakubowicz and Czerniawska-Grzesinska [6].

The superior border of the iliopubic ramus is an area of considerable concern for a variety of surgical subspecialists. It serves as an anchoring site for inguinal and femoral hernia repairs, radical cystectomies and others. Connection between pubic rami of inferior epigastric and obturator arteries has been referred to as the corona mortis (Crown of death) [1, 5–7, 9]. It is generally considered to be an arterial connection. Less information is available regarding the incidence and location of venous communication [9]. Traditional surgical teaching warns of the danger of dissecting blindly along the iliopectineal line for fear of laceration of the Crown of death.

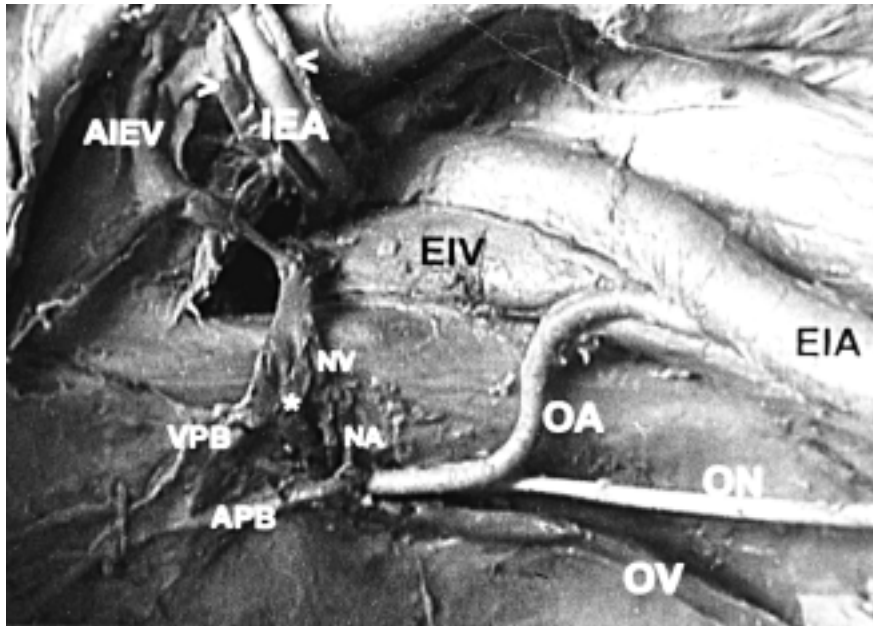
## CASE REPORT

Some multiple vessel variations in the retropubic region of a 55-year-old male cadaver were encountered. In the present case, obturator artery had its

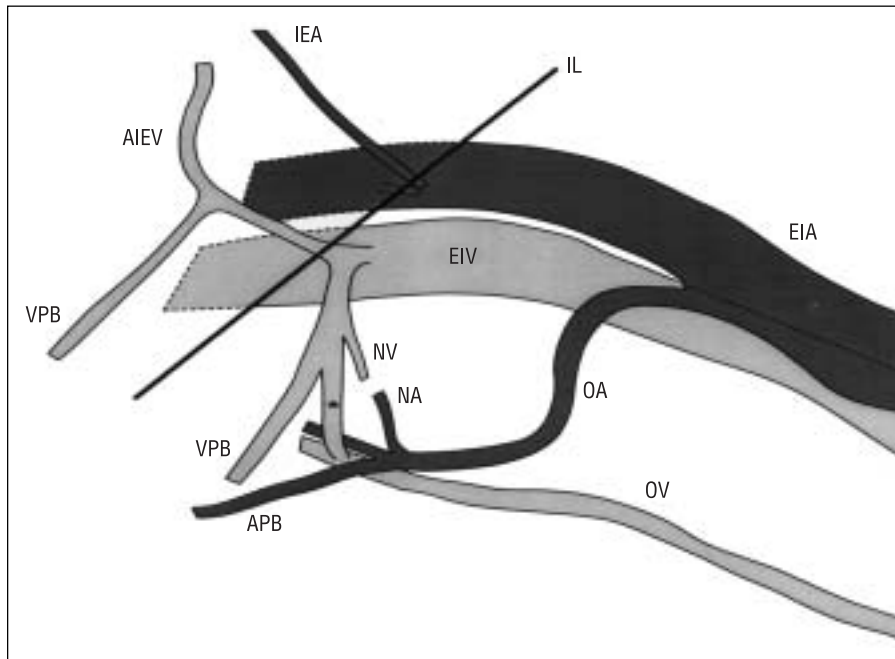
origin from the external iliac artery (Fig. 1, 2). The origination level was 2 cm. above the inguinal ligament. Moreover, inferior epigastric artery had its origin from the femoral artery. It was found that there was an anastomosis between obturator and inferior epigastric veins (venous corona mortis).

## DISCUSSION

The most common source of the obturator artery is as a single branch arising from the internal iliac artery. However, literature contains some articles which report variable origin. The existence of a common origin for the inferior epigastric and obturator arteries is a relatively frequent variation, occurring in 20–30% [1]. However, the involvement of a third artery, namely the medial circumflex, or deep femoral artery, arising from a common origin together with these two arteries is extremely infrequent. Emura et al. [3] reported a trunk for the medial circumflex femoral, inferior epigastric and obturator arteries arising from the femoral artery in one case. In contrast to this report, Sanudo et al. [8] reported the common trunk for the same arteries arising from the external iliac artery in two cases. Additionally, a common trunk for the deep femoral, medial circumflex femoral, inferior epigastric and obturator arteries arising from femoral artery was described by Emura et al. [3] in one case. Bilgic and Sahin [2] re-



**Figure 1.** Obturator artery origination from external iliac artery and venous corona mortis anastomosis; EIA — external iliac artery, EIV — external iliac vein, OA — obturator artery, OV — obturator vein, ON — obturator nerve, IEA — inferior epigastric artery, arrows: inferior epigastric veins, AIEV — accessory inferior epigastric vein, VPB — venous pubic branch, APB — arterial pubic branch, NV — nutrient vein to the pubic bone, NA — nutrient artery to the pubic bone.



**Figure 2.** Schematic presentation of the anomalies illustrated in Figure 1; EIA — external iliac artery, OA — obturator artery, OV — obturator vein, IEA — inferior epigastric artery, AIEV — accessory inferior epigastric vein, VPB — venous pubic branch, APB — arterial pubic branch, NV — nutrient vein to the pubic bone, NA — nutrient artery to the pubic bone.

ported a newborn cadaver with a common trunk for the obturator, inferior epigastric and deep femoral arteries arising from the external iliac artery.

Interesting anomalies in the origin and course of the principal arteries of the lower limbs have long received the attention of anatomists and surgeons.

They usually result from embryologic abnormalities of the arterial network of the lower limb. The embryologic development of the vascular plexus of the lower limb is based on an unusual selection of channels, some of which enlarge while the others contract and disappear, thereby establishing the final pattern. Before pelvic and femoral arteries appear as independent blood vessels from the rete pelvicum and rete femorale respectively, the blood flow destined for this territory makes an unexpected choice of source channels [2, 8]. The origination of the obturator artery from external iliac artery and inferior epigastric artery from femoral artery may be caused by such an unusual selection of channels.

It was reported that the ratio of the frequency of the origin of the obturator artery from the internal iliac artery to those from the epigastric and external iliac is 3 to 1 [1]. We could not find any obturator artery origination from the inferior epigastric artery. Bergman et al. [1] reported that the origin of the obturator artery from the external iliac is not very common, and rarely occurs except in females. Similarly, our case was a male cadaver.

Jakubowicz and Czerniawska-Grzesinska [6] studied variability in origin and topography of the inferior epigastric and obturator arteries and found that in 4% of cases there was a common trunk for inferior epigastric and obturator arteries. Additionally, they described that obturator artery originated from the inferior epigastric artery in 2.6% of their cases, and from the external iliac artery in 1.3% of their cases.

Missankov et al. [7] studied the variations of the arterial and venous pubic anastomoses and found that forty-four percent of the arterial pubic anastomoses were replaced by an obturator artery arising from the inferior epigastric and 25% by an obturator artery arising from the external iliac artery.

Classical anatomy textbooks provide detailed information about the arterial anastomoses of corona

mortis, they do not give a thorough description of the venous system. The tiny anastomoses between the obturator and external iliac system in the retro-pubic region have been described, but the investigators neglected to mention that these anastomoses can be life-threatening.

## CONCLUSION

The unexpected presence of the variant vessels in the retro-pubic region can become a matter of great concern to orthopaedic surgeons, urologists, gynaecologists and general surgeons, any of whom may perform surgical procedures in this area.

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