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Research Paper

Variation in The Origin of Obturator Artery in Population of Mahakaushal Region and its Clinical Importance

Medical Science

KEYWORDS : Obturator artery; Variations;

ShashiKant Verma — M.B.B.S. , M.S. (Anatomy) Associate Professor Department of Anatomy, N.S.C.B. Medical College Jabalpur (M.P.) 482003

*** Natwar Lal Agrawal** — M.B.B.S., M.S (Anatomy) Associate Professor Department of Anatomy, N.S.C.B. Medical College Jabalpur (M.P.) 482003 * Corresponding author

ABSTRACT

Aim: to study the variation in the origin of obturator artery in mahakaushal region.

Materials & Methods : . This study consists of 54 human hemi pelvises obtained from 27 adult cadavers out of them 21 were males and 6 were females within the age group of 45 to 85 years. Which were preserved and fixed by formalin in the department of anatomy the pelvis was first separated by transaction at the level of the L4 – L5 articulation. . The obturator artery was identified and traced from its origin to its exit at the obturator foramen along with the obturator nerve and vein..

Results: It was observed that out of 54 cases obturator artery in 36 (66.67%) cases originated from anterior trunk and in 13 (24.07%) cases originated from posterior trunk of internal iliac artery and in 5 (9.25%) cases it originated from inferior epigastric artery which is branch of external iliac artery

Conclusion: The study concluded that the OA is most commonly originated from the anterior trunk of IIA and least commonly from the inferior epigastric artery

Introduction:

The knowledge of variation in origin of obturator artery can be obtained by thorough understanding of anatomy of obturator artery and related vessels. The obturator artery deserves a detailed study since it has marked variations in its origin and course with surgical relevance.[1] It is very needful to understand the vascular pattern in the abdomen and pelvis due to rapid development of surgical procedure and investigatory techniques involved in obstetric procedure and urogenital interventions.[2] obturator artery is one of the branch of the anterior division of the internal iliac artery runs anteroinferiorly from the anterior trunk on the lateral pelvic wall to the upper part of the obturator foramen apart from the other branches it gives off a pubic branch which ascends over the pubis to anastmose with the contra lateral artery and the pubic branch of inferior epigastric artery and then obturator artery leaves the pelvic cavity via obturator canal and divides into anterior and posterior branches.[3]

When the pubic branch of obturator artery joins the pubic branch of inferior epigastric artery it is known as aberrant obturator artery and it may cross the superior pubic ramus , closely related with femoral ring and are very much susceptible to be injured during the dissection of the retropubic space. Surgeons dealing with direct or indirect inguinal, femoral or obturator hernia need to know the variation of obturator artery and their close proximity with the femoral ring. For this purpose the human cadaver is probably an idel model to explore the surgical anatomy.[4] so that a sound knowledge of this anatomy is very essential for successful performance of endoscopic total extra peritoneal inguinal hernioplasty as well as laparoscopic herniorraphy,[5]

Materials and method:

This study was performed in Department of Anatomy of N.S.C.B. medical college Jabalpur M.P. during the period of march 2015 to august 2015. This study consists of 54 human hemi pelvises obtained from 27 adult cadavers out of them 21 were males and 6 were females within the age group of 45 to 85 years. Which were preserved and fixed by formalin in the department of anatomy the pelvis was first separated by transaction at the level of the L_4 - L_5 articulation in which hip joints were already disarticulated by preclinical medical students than the pelvis was bisected longitudinally in the midline passing through the pubic symphysis and midline of the vertebrae following the dissection steps given in Cunningham's manual of practical anatomy. [6] To expose the branches of the common iliac artery, the internal iliac artery along with its anterior and posterior division and their further subdivision were carefully traced by separating it from the surrounding structures. The obturator artery was identified and traced from its origin to its exit at the obturator foramen along with the obturator nerve and vein..

The origin of obturator artery its relationship with adjacent structures and branching pattern was recorded and photographs were taken to document the variation.

Results:

A prospective study of 54 formalin fixed hemi pelvises was conducted. It was observed that out of 54 cases obturator artery in 36 (66.67%) cases originated from anterior trunk and in 13 (24.07%) cases originated from posterior trunk of internal iliac artery and in 5 (9.25%) cases it originated from inferior epigastric artery which is branch of external iliac artery. [Table -1].. [figure -1].

Table 1

Origin of obturator artery from Internal and External Iliac artery

Artery No. %			Male (n=42)		Female (n= 12)		Total (n=54)	
			No.	%	No.	%		
Internal. Iliac Artery	Anterior Trunk (66.67%)	Direct	10	23.8	07	58.33	17	31.48
		Comman trunk of IG+IP	12	28.57	02	16.67	14	25.92
		Inferior gluteal artery	05	11.90	00	00	05	9.25
	Posteior trunk (24.07%)	Direct	05	11.90	02	16.67	07	12.96
		Superior glutael artery	05	11.90	01	8.33	06	11.11
External iliac artery	Inferior epigastric artery (9.25%)		05	11.90	00	00	05	9.25
Total			42		12		54	

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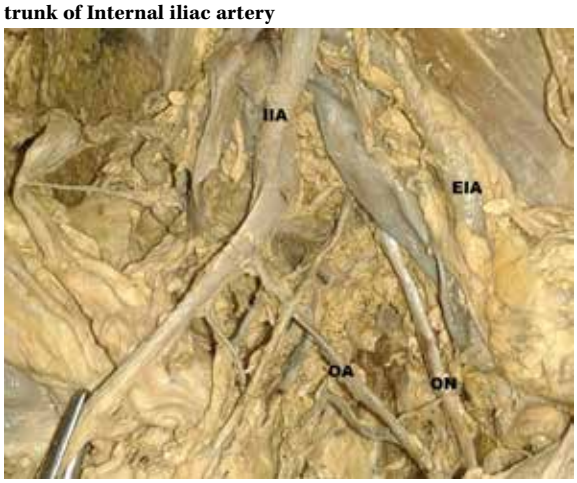
Figure 1 showing origin of obturator artery from anterior trunk of Internal iliac artery



Discussion:

The obturator artery (OA) in the pelvis is related laterally to the fascia over obturator internus and is crossed on its medial aspect by the ureter and in the male by the vas deference, in the nulliparous female the ovary lies medial to it. The obturator nerve is above and vein lies below to it. [3] **In our study** In 66.67% of cases the obturator artery (OA) originated from the anterior trunk of internal iliac artery (IIA). the most common source of origin OA is a single branch arising from the anterior division of the IIA.[4] Bergman et al [7] reported that origin of OA from IIA is three times more frequent than those arising from inferior epigastric artery or External Iliac artery (EIA). Braithwaite et al [8] had dissected 167 specimens and noticed that in 41% of cases the OA originated from the anterior division of IIA.In 24.07% of cases the OA originated from posterior trunk of IIA. The origin of OA from the posterior division of IIA is due to persistence of vascular channel in relation to the posterior division that might have given rise to the OA, while the vascular channels related to the anterior division of the IIA destined for the OA have disappeared. The longer OA due to its origin from the posterior division of the IIA may present an additional advantage while grafting.[9] In 9.25% of cases the OA originated from Inferior epigastric artery. Pick et al [10] had dissected 640 cadavers and found that in 26% of cases the OA originated from inferior epigastric artery.

To enable comparison the origin of OA from the umbilical artery, inferior gluteal artey (IG), the common trunk for the IG and IP (internal Pudendal) artery are included under the anterior trunk and the origin from superior Gluteal (SG) and iliolumber artery are included under the posterior trunk.

Origin of OA has been reported by various authors out of them Sumanthilatha S, Sakthivel & Swati P, and Pai MM studies has been compared with our study given in [Table 2].

S.No.	Mode of origin	PaiMM (2009)	Sumanthilatha S (2013)	Sakthivel & Swati P (2013)	Ourstudy (2015)
1	Anterior Trunk	61.43%	47.3%	36.67%	66.67%
2	Posterior division with iliolumber	8.33%	7.8%	15%	12.96%
3	Superior gluteal artery	10.41%	5.2%	15%	11.11%
4	Main stem of EIA	5.20%	3.5%	8.33%	---------
5	Inferior epigastric artery	14.58%	31%	25%	9.25%

The study concluded that the OA is most commonly originated from the anterior trunk of IIA and least commonly from the inferior epigastric artery. Our study highly coincides with the study done by MM Pai when origin of OA from Anterior trunk. Superior gluteal artery and up to some extent from inferior epigastric artery and coincides with the study done by Sakthivel & Swati P when OA originated from posterior division with iliolumber artery. In our study no branch originated from main stem of External Iliac Artery.

Conclusion:

During surgical repair of hernia and fracture of superior pubic ramus the OA may be injured due to anomalous origin from the external iliac artery or from the inferior epigastric artery might lead to profuse bleeding.[11] A detailed description of OA is not available from mahakaushal region hence this study was conducted with the objectives of assessing the variability of OA and their clinical importance in this region.

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