OBSERVATION ON VARIATIONS IN MORPHOLOGY OF UTERINE TUBES IN DIFFERENT AGE GROUPS

Saif Omar[1], Nafees Fatima[2], Ghazala Perween[3]

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ABSTRACT: Uterine tubes are a pair of musculomembranous tubes which are vital for female fertility. They are not merely conduits for tubal transport. Though there has been considerable advancement and success in IVF, the uterine tubes cannot be neglected as during physiological pregnancy the tubes play a pivotal role in gamete transport, fertilization and early embryonic development. Anatomical knowledge of variations in the morphology of uterine tubes is a prerequisite for treatment and management of infertility and tubal pregnancy.
KEYWORDS: Uterine tube, IVF, infertility, fertilization, pregnancy.

INTRODUCTION: The uterine tubes also known as fallopian tubes are bilateral ducts that extend from the uterus to the ovary and connect the uterine cavity to the peritoneal cavity.[1] They are of paramesonephric duct origin and range from 7-12 cm in length and usually less than 1 cm in diameter.[2] Each tube on an average is about 10 cm long.[3] and is almost completely surrounded by peritoneum along the superior margin of the broad ligament as the anterior and posterior laminae of the ligament become continuous with one another around the tube. The part of the broad ligament between the tube and the base of the mesovarium is called the mesosalpinx. The lateral part of the tube arches over the lateral pole of the ovary and turns posteriorly. Its trumpet-shaped expanded open end becomes closely applied to the ovary. The tube consists of four main parts: intramural, isthmus, ampulla, and infundibulum.[3] The intramural part is 07.mm wide and 1cm long.[3] The isthmus is 1-5 mm wide and 3 cm long.[3] The ampulla is 1 cm wide and 5 cm long.[3]

The infundibulum is 1 mm wide and 2 cm long.[3] The ampulla has a thin wall and a tortuously folded luminal surface. Typically fertilization takes place in its lumen. The above-mentioned four parts are recognizable in each tube. The intramural part of the tube traverses the thick uterine wall and opens into the uterine cavity. The isthmus is a very narrow segment of the tube. The ampulla is wide, thin walled and tortuous. The infundibulum is the funnel-shaped or trumpet-shaped lateral expansion of the tube. The wide circumference of the infundibulum presents numerous fingerlike processes called fimbriae one of which the ovarian fimbria in particular is attached to the ovary.

The uterine tube has a narrow lumen that is filled by highly complex folds of its ciliated mucosa. Patency of the tubes can be tested as it is done in cases of infertility, by filling the uterine cavity with radiopaque contrast medium through the cervix and observing on x-ray film the spillage of the medium into the peritoneal cavity through the tubes.[1] This procedure is termed as salpingography. Variations in the morphology of the uterine tubes can impact pregnancy. Scarring in the uterine tubes can prevent pregnancy because it stops the ovum from

travelling into the uterus. Uterine tube disorders are the cause in approximately thirty percent of female infertility problems.[4] Damage can be a sequel to surgery, tubal pregnancy, endometriosis or pelvic inflammatory disease.

MATERIALS & METHODS: After obtaining clearance from the Institutional Ethics Committee, surgically removed one hundred bilateral uterine tube specimens were obtained from the Department of Obstetrics and Gynaecology from fifty cases which were divided into two groups, premenopausal (35-40 years; 20 cases; n=40) and postmenopausal (46-60 years; 30 cases; n=60). The study was spread out over a span of two years. The cases in premenopausal age group had completed their families and had volunteered for desired infertility as a sequel to hysterosalpingectomy performed for pathological indications while those in the postmenopausal age group were tubectomized for surgeries involving the uterus and its adnexa.

The samples were washed under running tap water and blood clots were removed as far as possible. Overnight fixation was performed by immersing the samples in 10% formaldehyde solution in separately labeled jars for each group. The parameters studied were total length of the tube, bilateral differences in length and variations in arterial supply if any. Length of the lateral three segments of the uterine tube was measured using a thread and a ruler after cutting the tube from the point of entry into the uterus. The intramural part was measured using a wire and a ruler after cutting open the cavity of the uterus longitudinally.

OBSERVATION: Arterial supply of the uterine tubes in all cases was derived from branches of ovarian and uterine arteries. No other source of arterial supply was observed and no vascular anomaly was recorded. No significant bilateral difference in length of the uterine tubes was observed in any case of each group.

Group	No. of Samples	Length of Right Tube Mean±SD	Length of Left Tube Mean±SD	Arterial Supply
Premenopausal	n = 40	12.08±0.46	12.52±0.16	U. art & O. art
Postmenopausal	n = 60	10.02±0.22	10.12±0.18	U. art & O. art

Table 1: No. of samples, Mean length of each side and arterial supply in each group

U. art = Uterine artery
O. art = Ovarian artery

DISCUSSION: Female sexual development is independent of ovaries or hormones. The uterine tubes develop from the unpaired distal ends of the müllerian ducts. Congenital anomalies of the uterine tubes include accessory ostia, complete or segmental absence of the tube and several embryonic cystic remnants.[5] The remnants of the mesonephric duct in the female include a few blind tubules in the mesovarium, the epoophoron and similar ones adjacent to the uterus, collectively the paroophoron.[6] Paratubal cysts are frequent incidental discoveries during gynecologic operations.[5] Such cysts may be paramesonephric, mesonephric or mesothelial in origin and are mainly slow growing and asymptomatic. Many are discovered during the third to

fourth decade of life. In the present study we did not find any anomaly in the arterial supply of the uterine tubes. In all the cases we found the uterine tubes to be mainly bilaterally equal in length. Variations in length in both groups were observed. The premenopausal group had a mean length of 12.08±0.46 (Right) and 12.52±0.16 (Left). The postmenopausal group had a mean length of 10.02±0.22 (Right) and 10.12±0.18 (Left). The length of uterine tube is in an adult is 11-12 cm.[7] This corroborates with our findings in the premenopausal group. After menopause the uterine tubes gradually involute.[8] This corroborates with our findings in the postmenopausal group. The uterine tubes are relatively short and wide until puberty and after menopause they gradually involute and become functionally quiet.[9] It was observed in this study that there were notable differences in length of the uterine tubes in both groups.

CONCLUSION: Life begins in the uterine tube and tubal disease alone can account for upto thirty percent of cases of female infertility. During ovulation the lumen of uterine tubes provides optimum environment for fertilization and the muscle coat contracts in a complex coordinated manner and propels the ovum from the lateral end to the medial end of the tube. Effective tubal transport of ova, sperm and embryos is a prerequisite for successful pregnancies.

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ORIGINAL RESEARCH ARTICLE

AUTHORS:

1. Saif Omar
2. Nafees Fatima
3. Ghazala Perween

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Anatomy, Katihar Medical College, Katihar, Bihar.
2. Assistant Professor, Department of Anatomy, F. I. Maulana Ali Mian Medical College, Unnao, Uttar Pradesh.
3. Junior Resident, Department of Anatomy, Katihar Medical College, Katihar, Bihar.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Saif Omar,
Associate Professor,
Department of Anatomy,
Katihar Medical College,
Katihar – 854105, Bihar.
E-mail: drsaifomar@gmail.com

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