LAPAROTOMIES AFTER PUERPERAL TUBAL STERILIZATION

by

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Growing population of the country and restricted agricultural and economic resources have made the control of population a necessity. The countrywide publicity of the methods of conception control have made people conversant with the operative method of contraception. Tubal sterilization is becoming more and more acceptable to women. Still the long-term results of the operation are a subject of controversy. The main after-effects of the operation, as reported by various observers, are menstrual upsets and development of morbid changes in pelvis.

The present study aims at studying the morbid anatomy after tubal sterilization.

Material and Methods

The present study consists of a series of 50 patients who were sterilized by modified Pomeroy's method in K. R. Hospital, Gwalior, and were subsequently followed up.

In the method used, a loop of fallopian tube was crushed, each limb of the loop separately ligated with linen thread, and a catgut hemostatic suture passed through the mesosalpinx of the loop. The part of the loop above the crushed portion was then excised.

Out of these 50 cases, on 5 patients laparotomy was performed afterwards for some indication or the other. Endometrial biopsy was taken in each case before laparotomy. A detailed menstrual history was recorded. At laparotomy the tubes, ovaries and uterus were inspected. Where necessary they were excised and were submitted to histopathology examination.

Observations

Case No. 32. Mrs. S. 35 years old, a seventh gravida, was sterilized on the third day of delivery on socio-economic grounds in 1951 June. Before the operation her menstrual cycle was regular, being 5/30 days. After the operation she developed menorrhagia and polymenorrhoea, the cycle being 5-10/20-25 days. Clinically no abnormality was found in the pelvis. She also complained of leucorrhoea. The vaginal and cervical smears did not show any abnormality. The endometrial biopsy revealed hyperplastic non-secretory endometrium with cystic dilatation of glands. Laparotomy was performed on 25-9-59. At the time of operation both the tubes were found to be normal. The cut ends of the previously excised loops were separated by one inch. The uterus and the ovaries looked to be normal. A pan-hysterectomy was performed. The uterus with adnexa did not reveal any abnormality histologically, except for a hyperplastic non-secretory endometrium with cystic dilatation of the glands.

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Received for publication on 29-3-63.

Case No. 38. Smt. Sh. 34 years old, a seventh para, was sterilized on 5-4-54 on the fifth day of delivery. Before the operation her menstrual cycle was regular, being 4/30 days. After the operation there was no change in the cycle. Vaginal examination did not reveal any abnormality. Endometrium showed secretory phase. On 5-8-58 laparotomy was performed for suspected renal calculus. The cut limbs of the previously excised loops of the fallopian tubes were one inch apart. The uterus, tubes and the ovaries were apparently normal.

Case No. 39. Smt. L. 33 years old, a fifth para, was sterilised in June 1953 on sixth day of delivery. Previous to the operation her menstrual cycle was 15/60-75 days, the flow being excessive and painless. She complained of backache and regression of the breasts. There was no change in the menstrual cycle. Endometrium was hyperplastic and non-secretory. On 18-9-58 laparotomy was performed. Pan-hysterectomy was done. Uterus and adnexa were normal both macroscopically and microscopically.

Case No. 40. Mrs. M. forty years old, a seventh gravida, was sterilised in June 1951, on third day of delivery. Before the operation her menstrual cycle was 3/30 days. After the operation there was no change in the cycle. Vaginal examination revealed that the uterus was irregulariy enlarged to 22 weeks' size of pregnancy. It was firm in consistency. The fornices were free. Endometrial biopsy showed atrophic endometrium. Laparotomy was performed on 31-7-58. The uterus was enlarged to 22 weeks' size of pregnancy and was firm. The adenexa were apparently normal. The cut ends of the previously excised loops of the tubes were one inch apart. Pan-hysterectomy was performed. Histological section of uterus showed leiomyoma of the wall, and atrophic endometrium. The tubes and the ovaries showed normal histology.

Case No. 41. Mrs. R. D., 27 years old, a fifth para, was sterilised on 25-6-56, on third day of delivery. Previous to the operation her menstrual cycle was 5-6/30 days. On 19-7-58 she was readmitted to the hospital. She gave birth to a full-term, healthy, live, male baby on the same day (due to failure of sterilization). Endometrial biopsy after three months showed secretory endometrium. Internal examination did not reveal any abnormality. On 29-10-58 hystero-salpingography was performed. Both the tubes were blocked one inch beyond the uterine ends. Laparotomy was performed on 7-11-58. The uterus and ovaries were apparently normal. The cut ends of the previously excised loops of the tubes were still separated by a bridge of mesosalpinx ¾ inch long. No macroscopic continuity between them could be demonstrated. The tubes were then excised from the isthmus to the fimbriated ends. Histological section of the tubes did not reveal any abnormality.

The observations are tabulated below:—

TABLE I

No. Case	Age at time of operation	Interval between sterilization and laparotomy	Messtrual disturbance	Endometrial biopsy	Pathological change
1.	27 years	8 years 3 months	menorrhagia polymenorrhoea	Hyperplastic nonsecretory endometrium with cystic dilatation of glands	nil
2.	30 years	4 years 4 months	nil	Secretory phase	nil
3.	28 years	5 years 3 months	nil	Hyperplastic nonsecretory	nil
4.	33 years	7 years	nil	Atrophic endometrium	Fibroid uterus
5.	26 years	2 years 2 months	nil	Secretory phase	nil

Discussion

The results of the present series are compared with those of other authors in Table II.

TABLE II

Author	Total no. of cases	Cases showing pelvic pathology	Interval between sterilization and laparotomy	Type of pathological change
Koller (1935)		3	6 years, 8 years, 12 years	Hydrosalpinx
Wilhams et al (1951)	200	30	10 years	Pelvic infection (16) Endometriosis (8) Adenomyosis (4) Cancer endometrium (2)
Eastman & Prystowsky (1955)	1478	135	20 years	Pelvic affections
Jensen & Lester (1957)	734	66	10 years	Pelvic complications
Berthelsen (1957)	293	4	10 years	Pelvic complications
Bose (1958)	464	3	10 years	Hydrosalpinx (1) Tubo-ovarian mass (2)
Mehta & Mehta (1958)	286	1	10 years	Prolapse uterus
Grayburn (1958)		1	12 years	Hydrosalpinx
Present Series (1960)	50	1	2-8 years	Fibromyoma

Formation of Hydrosalpinx. The resulting hydrosalpinx mentioned by Koller, Grayburn and Bose may be caused by either of two factors. (i) Following mild salpingitis or peritubal infection (as a result of operation) each end of the tube becomes sealed off and the secretion accumulates in the lumen of the tube. The tube gradually distends. (ii) As a late outcome of pyosalpinx. The purulent material gets reabsorbed and the clear fluid is left behind resulting in hydrosalpinx (Novak).

Chronic Pelvic Inflammatory Masses. Their formation is explained variously. Purandare is of the opinion that following Pomeroy's method of sterilization, a big raw surface of the tube is left. On it adhesions are formed, which later on lead to formation of inflammatory masses. Ajit Mehta attributes them to the hematoma formation from bleeding due to improper hemostasis. This hematoma gets infected and subsequently gives rise to pelvic masses. Saraiya is of the opinion that the non-absorbable material which is used to ligate the tubes gives rise to in-

flammation and masses, should the infection occur in the uterus or other pelvic organ.

Cystic Changes in Ovaries. Backman and Mehta are of the opinion that interference with the blood supply of the ovaries, due to tubal ligation, gives rise to cystic ovaries and later on to their atrophy.

Collins et al (1950) have shown that the ligation of ovarian vessels and even of inferior vena cava does not severely interfere with the ovulatory functions in most people. The morbidity in these cases is not high. There is no change in the vascularity of abdominal wall, pelvis, vagina or the rectum. Menstrual and sexual functions remain unchanged.

Work done on experimental animals is also inconclusive.

Navori et al (1952) have shown that in rats tubal ligation leads to marked follicular stimulation and absence of corpus luteum after 30 days, and after 90 days the ovaries become cystic due to inadequacy of blood supply. This may lead to hyper-oestrinism, giving rise to hyperplastic endometrium, polymenorrhagia and menorrhagia, and later on to hypomenorrhoea and oligomenorrhoea.

Tenney et al (1955) have experimentally shown that ligation of oviducts in rabbits brings about follicular and fibroblastic proliferation in stroma. By 8 to 10 weeks the ovaries contain large vacuolated interstitial cells-"Interstitial Bodies"-which indicate premature aging. Similar changes may be expected in the human females.

Formation of Uterine Fibroids and Adenomyosis. These may be explained on the basis of hyperestrinism due to cystic ovaries, and due to "unresolved myometrial stress", which is now produced due to absence of child-bearing.

Thus may be explained the various disturbances of menstruation which follow the operation of tubal sterilization. Interference with the blood supply of the ovaries may give rise to cystic ovaries and hyper-estrinism. A mild infection may give rise to the formation of hydrosalpinx. These two together may give rise to polymenorrhoea, menorrhagia, and metropathia hemorrhagica. Afterwards when the ovaries undergo atrophy hypomenorrhoea and oligomenorrhoea may follow leading to "premature" menopause.

Others regard these distrubances as coincidental (Wilhams (1950) and Saraiya (1958)).

Conclusions

1. Long term follow up of the patients of tubal sterilization may show presence of some pathological changes, like development of hydrosalpinx, cystic ovaries, pelvic infections, fibromyoma, adenomyosis, and endometriosis.
2. The basic pathology of all these changes is interference with the blood supply of the ovaries and mild infection.
3. This can explain the various menstrual disturbances which follow the operation of tubal ligation.

Summary

1. A series of 5 cases of laparotomy in patients who underwent the operation of sterilization is presented.

2. The results are compared with the work done elsewhere.

3. An attempt is made to explain the development of morbid anatomy and morbid physiology.

Acknowledgements

I am very grateful to Dr. (Miss) L. V. Phatak, F.R.C.S., Professor of Obstetries and Gynaecology, G. R. Medical College, Gwalior, for her kind guidance and the Superintendent, J. A. Group of Hospitals, Gwalior, for permitting me to present this series.

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