REVIEW OF LITERATURE
REVIEW OF METHOD OF TUBAL STERILIZATION

The operation of sterilization was first recorded in literature in 1836, when Bhindell advised section of the tube to prevent conception in cases with anticipated difficulties in delivery.

The first authentic report about a tubal sterilization performed with caesarian section came from Tolado, Ohio in 1880.

Few technique of tubal ligation are described below;

Cornual resection was popularized by Naumaun in 1898.

Madlener in 1919 described his technique A loop of each tube is grasped with forceps & crushed at its base with a broad clamp. Each arm of the loop is ligated with non absorbable suture at the point of crushing.

Irving in 1924 described that the tubes are served and proximal and is buried in the Mesosalpinx.

Pomeroy 1930 advocated that the base of a tube is tied with catgut and the loop is excised distal to the point of ligation.

Labhardt 1937, subparitonel resection of isthmic portion of the tube leaving no possibility for spontaneous recanalization.
Kroener's fimbricetomy 1969 consist of resection of the last centimeter of the ampulla with the fimbria after ligature with silk.

The possible routes by which sterilization can be done:

1) When done at Caesarian section, Madlener or Pomeroy Method and more recently, two clips put at the Isthmus.

2) When done is post partum period (first 2 days) it is easily performed through a small semi circular infra umbilical incision under local anaesthesia.

3) Vaginal sterilization usually done at the time of termination of pregnancy.

4) Coliotomy - The vaginal route, by posterior Colpotomy in the Lithotomy position is the method of choice in India for most of the interval sterilization.

5) Culdoscopic Sterilization is another variant of the vaginal route it is in fact a posterior Colpotomy done in the knee chest position under local anaesthesia & heavy pre medication.

6) Sterilization may also be performed at laparotomy for fibroids, cysts etc. through a pfannersteil incision.
When sterilization is the only reason for laparotomy minimaps seen the best solution when laparoscopy cannot be used for practical or theoretical reasons.

MINILAPS CAN BE OF FOLLOWING TYPES

1- Infraumbilical.
2- Suprapubic (Low)
3- Suprapubic (High)
4- Uchida

LAPAROSCOPIC STERILIZATION

The original suggestion of Anderson power & Barnes (1941) that fulguration be used to damage the fallopian tube.

The different ways by which Laparoscopic sterilization can be done are as follows;

1- Electrocoagulation & Section of Isthmus.
2- Thermocoagulation done but no section.
3- Thermocoagulation and then cutting the coagulated segment.
4- Rings.
5- Clips.
Newer Surgical Techniques of Tubal Sterilization.

1- Minilaprotomy.

2- Colpotomy.

3- Endoscopic Technique.
   a) Laproscopy
   b) Culdoscopy
   c) Transcervical Method.

Transcervical methods of tubal sterilization have gained popularity & can be done in the following ways -

1- Hysteroscopic tubal cauter.

2- Tubal occlusion with chemical.

3- Transcervical tube occlusion with plugs.

4- Transcervical chemical ablation of endometrium.

REVIEW OF LITERATURE

The operation of sterilization is being done for more than a century, with the scary rise of world population, which is expected to reach 6 billion by 2000 A.D. it becomes mandatory for us to review the long term effects of the sterilization operation so that we can advocate this operation to the general public with confidence. Keeping this in view, many studies were carried out to evaluate the sequelae of tubal ligation operation. There is a general disagreement
among the clinicians regarding the long term effect of these operations, particularly in relation to the occurrence of functional and organic gynaecological disturbances.

Collins et al (1950) have shown that the ligation of ovarian vessels and even in inferior vena cava does not severely interfere with ovulatory functions in most women.

William, Jones and Merrill (1951) have reported that 30% of their patients out of the total of 200 developed complication within ten years following sterilization. Most common complication was functional uterine bleeding.

Navori, Fugo and Davis (1952) have shown that tubal ligation leads to marked follicular stimulation and absence of corpus luteum. Ovaries becomes cystic due to inadequacy of blood supply. This may lead to hyperoestrinism giving rise to hyperplastic endometrium, polymenorrhagia.

Mehta and Mehta (1958) reported that of the 116 cases many had menstrual disturbances polymenorrhoeas, dysmenorrhoea menorrhagia.

Dawn (1964) studied 42 sterilized women who reported with symptoms of profuse periods. These were the result of post sterilization pelvic lesions.

Purandare (1967) studied 406 cases after tubal sterilization, 18% of the patients had menorrhagia, 13.8% had polymenorrhoea, 47% had oligomenorrhoea, 3% had dysmenorrhoea. He stated that operation causes disturbances to ovarian blood
supply.

Kishore, Khambatta and Mullick (1973) studied 125 cases to tubal ligation for menstrual irregularities in relation to ovarian activities after sterilization by means of premenstrual vaginal smear, cervical mucous and endometrial biopsy the complication recorded are menstrual irregularities (66.6%) Chronic pain obesity. They concluded that ovarian activity after sterilization was either found to be normal or increased it could be psychological, neurovascular or due to presence of inflammation.

Neil J.R et al (1975) evaluated the late sequelae of sterilization by abdominal tubal ligation & laproscopic division. The period of follow up was ten to twenty eight months. Excessive menstrual loss was reported in 39% cases after laproscopic ligation, 22% cases after abdominal ligation as compared to 13% in control group. They concluded that increased tissue destruction and disruption of blood supply occurs due to operation.

Radwanska et al (1979) assessed luteal function in 40 women with normal menstrual cycles who had been sterilized by tubal ligation. Mid luteal mean serum progesteran levels in these 40 women (9.4 ng/ml) were significantly lower (P.500) than those (17.4 ng/ml) in a group of 24 females. In 25 of the sterilized women, serum 'P' was less than 10 ng/ml.
Eltagi (1981) examined possible causes of menstrual disturbances encountered after tubal ligation by correlating the post operative hormonal profile, endometrial findings, and menstrual patterns.

Serum estradiol 17-B and progesterone levels were determined in the 30 cases in 20 control cases. In cases with regular cycles blood samples were selected to represent the follicular mid cycle and luteal phases, while samples at 10 days intervals were collected for the remaining patients. The post sterilization pattern was normal in 18 cases.

Other 12 cases showed menstrual disturbances mostly in the form of polymenorrhagia. Low estradiol indicative of hypoestrinism were found in all cases.

SHETH S. SHIRISH et al (1981) studied 300 cases and compared the complication of sterilization by tubal ring & mandlener's technique. They followed up the patients at six monthly and yearly interval. They found incidence of scanty menses in 90% cases. 3.9% cases after 6 months of tubal ring ligation. While incidence of excessive flow during menstruation was 3.6% after tubal ring occlusion.

conventional and open laparoscopy, the prototype spring loaded clip & the rocket clip. 1/2 cases reported an increase in the amount of menstrual flow, & 1/2 reported a decrease.

According to Cooper (1983) the sterilized women have an increased risk of subsequent gynaecological admission & hysterectomy.

The interval between sterilization and hysterectomy varies from 6 month to 6 years. All the hysterectomies were for dysfunctional uterine bleeding and only 4 were over 40 years old at the time of hysterectomy. Although the number of cases were small and the period covered by the data preceeded the considerable decrease in sterilization in the risk of hysterectomy for menorrhagia.

According to Cole et al (1984) - A carefully controlled study using an index of menstrual pattern changes which evaluates 4 menstrual parameters simultaneously indicates that most women report no change in menstrual pattern at 12 months post sterilization, among those who do experience change, change in 1 direction are balanced by changes in the other direction the best predictor of whether a women would experience menstrual pattern change after sterilization is whether her pattern had any abnormal characteristics during the 3 months prior to the procedure.
Cattanach (1985) made effort to determine whether a disturbed estrogen / progesterone ratio is a likely explanation for increased incidence of menorrhagia concentration of estrogen and progesterone at ovulation were measured in 7 women who had used the billings ovulation method to identify ovulation and who had subsequently undergone tubal ligation. A possible causes of the estrogen deficiency syndrome might be a disturbance in the estrogen / progesterone ratio resulting from localized hypertension at the ovary when the utero-ovarian arterial loops is ocelled at tubal ligation production of estrogen and progesterone by the ovary is dependent on blood supply, in balance in the estrogen / progesterone ratio pre-suppose that progesterone production is less markedly affected than estrogen production. Between 3.3 and 8 times more Oxygen is required to produce one mol of estrogen than to produces one mol of progesterone.

Jacques, Michel et al (1986) studied that luteal function in women after tubal ligation. Progesterone levels and endometrial biopsies were obtained in the mid-luteal phase 5 to 10 days. before the next menstrual period. The group of women who had been sterilized by tubal ligation had a significantly lower ( P < .001) mean midluteal progesterone level (8.5 ± 6.0 ng/ml) than the group of women who had been sterilized by Hulka clips method (154 ± 6.3 ng/ml) and the control group
(17.2 \pm 4.8 \text{ ng/ml}). A retarded endometrium was observed more frequently in the women who underwent tubal ligation. 2 days lag in endometrial histology is sufficient to diagnose luteal insufficiency.

Jeffrey et al (1986) analysed the data from the walnut creek contraceptive drug study to compare the menstrual characteristics of 719 women who had tubal sterilization. Sterilized women increase the risks of menstrual cramps and adverse menstrual bleeding.

Mitchell et al (1989) compared the menstrual problem in cases who underwent pomeroy ligation and bipolar coagulation and cases whose husbands obtained vasectomy. They saw that these women experienced a significant higher number of adverse changes than compare to other group.

Garnet Anderson et al (1990) studied long term risk of hystrectomy. They studied 7414 women aged 20 to 49 years who had tubal ligation 10 years back compared with a population cohort of nonsterilized women. Women sterilized were 3.4 times more likely to have had a subsequent hystrectomy for menstrual disturbances.

Kjer and Knudsen (1990) reported the high incidence of hystrectomy for bleeding disorder among sterilized women with comparison to nonsterilized population of the same age in Denmark.
Rofansky & Halbreich (1991) reported an association between tubal sterilization and the premenstrual syndrome. They compared the severity of symptoms and there possible correlation with hormonal level in 78 sterilized and non-sterilized women. Significant difference could be demonstrative between groups in both the retrospective and prospective evaluation of the severity of premenstrual symptoms as well as luteal hormonal levels.

Kirk, Shy et al (1992) reported that tubal sterilization is associated with a greater risk of hospitalization for menstrual disorders. In the sterilization cohort 282 had hospitalization for menstrual disorders was 2.4 times greater after tubal sterilization (95% confidence interval 2.0 to 2.9). This risk was 6.1 times greater for sterilized women age 20 to 24 years (95% confidence interval 0.72 to 3.2) compared with women nonsterilized.

Kauffman RN et al (1993) reported the unilateral or bilateral pelvic pain associated with vaginal spotting in women who had previously undergone tubal ligation followed by roller ball endometrial ablation. During the 1 to 5 years observation period, six women with the symptom complex had laparoscopy and hysteroscopy. In all cases marked endometrial scarring was noted. In every cases proximal portion of either one or both fallopain tube were swollen.
Davidson et al (1993) reported that there is long term effect of tubal sterilization on menstrual indices and pelvic pain. Five hundred women were studied at 6 to 10 months after surgery and 3 to 4.5 years later. The results were, there is increased cyclic bleeding, prolonged heavy periods, bleedings between periods and dysmenorrhea in comparison to nonsterilized women.

A. Chatterjee (1994) studied 56 patients in Durgapur Steelplant Hospital West Bengal & reported the ovarian changes after tubal ligation.

Tubal ligation disrupts the continuity of the tube alongwith accompanying vessels, nerves & lymphaties, the most noticeable being the vesascular arch created by terminal brands of ovarian & uterine arteries.

He found cystic ovaries (less than 6 cm.) 17.8% ovarian cysts 8.9% Tuboovarian cysts 5.3%.