

TERMINATION OF PREGNANCY BY VACUUM ASPIRATION WITH AND WITHOUT STERILIZATION

by

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Introduction

Creating negative pressure in the uterus for termination of pregnancy is reported to have been first used by Bykov in 1927. He introduced a cannula into the uterus and by means of a syringe produced negative pressure in the uterine cavity. According to Nilsson (1967) this method was used more than 30 years ago for obtaining endometrial biopsies by Lorincz (1934) and Novak (1935). However, there was no real interest in this procedure until the reports of Wu-Juan-Tai and Wu-Hsien-Chen (1958), Zubeev (1962), Takebayashi and Kikuchi (1964) and Chalupa (1964). Since 1964 it became widely used in Europe. At the Gynaecological Congress in Moscow in 1963, an account of 17,000 therapeutic abortions performed by this method was presented by MacPanova (1963). The earliest series reported from USA was that of Kerslake and Casey (1937). Different types of apparatus were used, the main difference being in the shape of the cannula and the material of which it was constructed. They all concluded that vacuum aspiration was a safe,

satisfactory and atraumatic method of abortion during the first trimester. Rajashekharan and Vijaya (1971) from India reported its use in some cases of inevitable, threatened and incomplete abortions.

Material and Methods

This investigation was conducted on 408 patients who were selected from the outpatient and Family Planning Clinics of the Department of Obstetrics and Gynaecology, Maulana Azad Medical College and associated Irwin and G. B. Pant Hospitals, New Delhi, from April 1972 to October, 1973. As most of our patients were multiparae with sufficient number of children, they were selected for sterilization together with the termination of pregnancy by the vaginal route. Abdominal ligation was required in 8 cases where it was suspected that vaginal route would be fraught with difficulty. Thus, the cases were divided into two groups: Group I consisted of 68 cases where simple termination of pregnancy was done without any concurrent sterilization; and Group II included 340 cases where tubal ligation was done along with the termination procedure.

All patients were admitted on the day prior to operation. Routine preliminary investigations e.g. blood for Hb%, urine for sugar and albumin and its microanalysis were carried out. Special invest-

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igations were done as and when indicated. No premedication was used except a mild sedation in the form of tablet luminal 120 mg. on the previous night. General or spinal anaesthesia was used for the majority of the cases. This is because most of the patients required tubal ligation along with termination. Local anaesthesia in the form of paracervical block was preferred in the cases of Group I.

The apparatus consisted of three parts: (a) suction cannula: Initially we were using metal cannulae but soon it was replaced by Karman's catheter which has a flexible length of transparent polythene tubing closed at one end with a rounded tip immediately below which were two eyes placed in series. The eyes were so placed that if the catheter was pushed against the wall of the uterine cavity the tip would bend rather than perforate the uterus. (b) Electric suction apparatus: This was an electric suction machine with a glass bottle devised by Berkeley Bio-Engineering Co. which created a negative pressure of about 70 cm. of Hg. (c) A small handle and transparent polythene tubing connecting the cannula to the glass bottle. The entire equipment had to be airtight to be effective. So it was checked each time before suction.

Procedure

Before taking the patient to the operating table she was asked to void urine. An infusion of 5% glucose was set up in all cases of Group II and those cases of Group I where the uterus was more than 8 weeks in size. Patient was anaesthetised; the part prepared with antiseptic and a pelvic examination was carried out. Cervix was exposed with a speculum and steadied with Allis's forceps. Before aspiration dilatation was done by Hegar's dila-

tors of same number or one less than the period of gestation in weeks. Multiparae having a pregnancy of 6-8 weeks often did not require any dilatation at all. After dilatation a Karman's catheter of suitable diameter was introduced into the uterine cavity. Vacuum suction was then switched on with a rotary motion of the cannula up and down into the uterine cavity till the products of conception could be seen passing through the cannula into the connecting tube and the suction bottle. Injection methergin 0.25 mg. was given intravenously before suction and 5 units of syntocinon was added into the infusion bottle when the uterus was above 8 weeks gestation in size. A routine gentle curettage was done at the end of each procedure to ensure that the uterine cavity was empty. Sterilization was performed by the Pomeroy's technique after the termination by opening the pouch of Douglas.

Hospital stay for Group II cases was slightly prolonged against that of Group I who were usually discharged the next day of the operation. An appointment was made for each of the patients to report to the clinic for follow up 3 weeks after discharge from the hospital and then at an interval of one month for three subsequent visits.

Results

Maximum number of abortions (70%) were carried out in the age group of 26-35 years. Only 15% were in the age group 14-25 years. They were mostly multiparae (94.6%), married (96%), belonging to lower socio-economic status (83.3%). Rest of the cases were either single, nulliparae or widowed or separated. Of all the cases 21.9% were totally illiterate, while 42.8% had put in some years at school and 35.3% had completed school or had some higher education.

TABLE I

Early and Late Complication in the Cases of Medical Termination of Pregnancy With or Without Tubal Ligation

Period of gestation	Without sterilization (68)					With sterilization (340)				
	Upto 6 weeks	7-10 weeks	11-12 weeks	Total	%	Upto 6 weeks	7-10 weeks	11-12 weeks	Total	%
No. of cases	18	44	6	68		96	220	24	340	
Blood loss (more than 300 ml)	—	2	1	3	4.4	—	9	3	12	3.5
Retained products	—	1	1	2	2.9	1	2	4	7	2.0
Perforation	—	—	—	—	—	—	1	—	1	0.3
Pyrexia	1	1	1	3	4.4	4	18	5	27	8.6
Pelvic infection	1	1	—	2	2.9	6	21	5	32	9.4
(a) Parametritis	1	1	—	2	2.9	6	15	2	23	6.8
(b) T.O. masses	—	—	—	—	—	—	5	2	7	2.0
(c) Abscess	—	—	—	—	—	—	1	1	2	0.6
Readmission for D & C	—	1	—	1	1.4	—	4	2	6	1.8
Psychotic	—	—	—	—	—	—	1	—	1	0.3

95.8% were Hindus, while Mohamedans (1.9%) and Christians (2.3%) formed a minority.

In 93% of the cases terminated by vacuum aspiration the gestation period was less than 10 weeks, while 7% were performed between 10-12 weeks. Multiparity with low socio-economic status (70%) and failure of contraception (8%) formed the prime indication for termination of pregnancy followed by psychological (13.8%) and eugenic (7.1%) reasons. Termination on medical grounds was very minimum (1.1%).

The majority of the cases were performed under general (68.2%) or spinal anaesthesia (17.4%). Local anaesthesia was used in 14.4% cases which included mostly cases belonging to Group I. Post-termination contraception could be employed in all but 25 cases in the form of sterilization (340 cases) IUCD (32 cases) and oral contraceptives (11 cases).

The complications commonly encountered were haemorrhage, retained products, post-abortal fever and pelvic infection. It was noted that the longer the period of gestation the higher was the complication rate. Average blood loss following vacuum aspiration upto 6 weeks was 26 ml. which increased to 85 ml. at 7-10 weeks and 150 ml. at 11-12 weeks. Excessive blood loss (more than 300 ml) was encountered in about 4% of cases who were mainly between 11-12 weeks of gestation.

Transfusion was required in 2(0.5%) cases undergoing termination.

Discussion

In most of the reported trials, the operation was done as an outpatient procedure though Dvorak *et al.*, (1967) admitted their patients one day before the operation. Pakter *et al.*, (1971) and

Tietze (1971) preferred general anaesthesia but most of the authors like Lewis *et al.*, (1971) and Margolis and Goldsmith (1971) performed the procedure under paracervical block. We preferred to do the operation under local anaesthesia when termination was not combined with sterilization but spinal or general anaesthesia was found satisfactory for group II cases. No major anaesthetic complication was observed except emesis in some cases following general anaesthesia.

Sufficient dilatation of the cervix was performed for the easy passage of a suction cannula of the proper size as recommended by Vojta (1967), though Nilson (1967) suggested that the cervix should be dilated maximum upto 8 Hegar's dilator in nulliparae and Hegar 10 in multiparae. On the other hand, Papazov *et al.*, (1965) and Margolis and Goldsmith (1971) claimed that dilatation was not necessary upto 10 weeks. Various types of dilators previously used by different authors have been well reviewed by Kerslake and Casey (1967).

Initially we were using suction cannulae made of metal but soon it was replaced by Karman's catheters. We used the same number of cannula or one less for each weeks of pregnancy as advocated by Nathanson (1971). Buckle and Anderson (1970) used an 8 mm. cannula for 6-7 weeks of gestation, 10 mm. for 8-10 weeks and 14 mm. for 12 weeks and over. We used a suction pressure of about 28 inches of Hg. (70 cms) which produced an effective aspiration of uterine contents. The average time taken to complete the operation was 4.1 minutes ranging from 2 to 10 minutes. Authors like Kerslake and Casey (1967), Margolis and Goldsmith (1971) recorded a time of 15 seconds to 3 minutes and 1 to

7 minutes, respectively. We fully agree with the opinions expressed by Chalupa (1964), Papazov *et al.*, (1965) and Eaton (1969) that aspiration time is directly dependant on the number of weeks of pregnancy, the type of suction curette and the amount of suction used.

The average hospital stay for the cases of simple termination was 1.4 days but it was prolonged to 4.6 days for the cases undergoing concurrent surgery. Lewis *et al.*, (1971), Margolis and Goldsmith (1971) and Strausz and Schulman (1971) used it as an outpatient procedure, while others like Kerslake and Casey (1967) and Vojta (1967) discharged their patients 1-3 days after the operation. Sogolow (1971), who combined vaginal tubal ligation in all of his 124 cases after termination of pregnancy by vacuum aspiration, recorded an average stay of 3 days ranging from 2-10 days.

Complications

It was observed that only 6 out of 68 patients in Group I suffered from more than one complication giving an overall complication rate of 7.3%, while it was found to be nearly double (14.1%) for the cases of Group II (Table I). Tietze (1971) and Mehta (1972) recorded a complication rate of 5.9% and 6.3% in medical termination by suction but it rose to 20.8% in the series reported by Mehta when he combined tubal ligation with termination of pregnancy. Boysen and McRae (1949) in their series of 169 cases of vaginal tubal ligation observed that the morbidity rate increased from 5.8% to 20% when the procedure was combined with abortion. Tamaskar (1970) had a morbidity rate of 14.5% following the same technique. In the present series complications following the operation were least when pregnan-

cies were terminated at 6 weeks and were highest between 10-12 weeks of gestation. Tietze (1971) found that the complication rate was slightly higher for the earliest abortions (6 weeks gestation or less) than for those carried out at 7-8 weeks, after which they gradually increased.

In general, blood loss was found to be directly related to the number of weeks of pregnancy and time taken for the operation. Vladov (1967) recorded an average blood loss of 31 ml. in first lunar month, 62 ml. in the second and 105 ml. in the 3rd following vacuum aspiration. It was 20-30 ml. upto 8 weeks in the series reported by Dvorak *et al.*, (1967) which was found to be increased with advancing gestation and increased markedly when ovum forceps was used to complete the evacuation. The same trend was also noticed in our series. Transfusion was required in 0.6 and 1.4% of the cases in the series reported by Jornkovsky (1963) and Strausz and Schulman (1971). We confirmed the observation by Eaton (1969) that blood loss could be reduced with the intravenous use of 0.2 mg. of Ergometrine just before the evacuation was started. We also agree with him that the blood loss is related with the time taken to complete the operation. The incidence of retained products has been variously reported as 5.0, 1.0 and 4% by Chalupa (1964), Nilsson (1967) and Lewis *et al.*, (1971), respectively. In the present study, the incidence of retained products rose with the increased duration of pregnancy. Repeat curettage was needed for 1.6% (out of 408) in this series, while that recorded by Buckle and Anderson (1970) and Strausz and Schulman (1971) was 1.7 and 2.2% respectively.

There was one case of uterine perfora-

tion in the initial period when metal suction cannulae were being used. No such case was encountered with the use of Karman's catheter. It was noticed in 0.5 and 0.2% by Buckle and Anderson (1970) and Srausz and Schulman (1971), respectively, while it was not observed by Chalupa (1964), Nilsson (1967) and Vladov (1967). No damage to the uterine or cervical wall was observed by Papazov *et al.*, (1965) as a result of vacuum aspiration. However, Melks and Roze (1961) reported fibres in 1.5% of their patients and Cernuha (1963) in 20%. The difference in the observations could be due to variations in the negative pressure used.

Febrile morbidity (38°C or more excluding the day of operation) was observed in 4.4% of cases of medical termination without sterilization in the present series but it nearly doubled (8.6%) when the procedure was combined with tubal ligation in Group II.

Vojta (1967) and Strausz and Schulman (1971) recorded a rate of 2.2% and 3.6%, while Margolis and Goldsmith (1971) could not find any such case in their series when they limited their procedure to 10 weeks of gestation only. Lee *et al.*, (1951) noticed febrile morbidity in 11.5% of their cases (78) of simple vaginal sterilization, while a morbidity rate of 18% was recorded by Fort and Alexander (1966) when they combined sterilization along with plastic repair of vagina.

Pelvic infection was noticed in 2.9% (2 out of 68) cases in the mildest form in Group I of this series but the rate jumped to 9.4% in cases of termination with tubal ligation. These included 7 cases of T.O. masses and 2 cases of pelvic abscess who required readmission for further treatment till they were cured.

The infection rate following vacuum aspiration was reported 3.7, 5.0 and 2.4% by Melks and Roze (1961), Chalupa (1964) and Dvorak *et al.*, (1967), while no case of infection was reported by Margolis and Goldsmith (1971) in their series. Sogolow (1971), in a series of 124 cases of vacuum aspiration with vaginal tubal ligation, observed an infection rate of 9.7% (12 out of 124). Rao (1971) presented 1821 cases of vaginal tubal sterilization which included 9 cases of pelvic abscess and 3 deaths following peritonitis. Incidence of pelvic abscess following tubectomy with other minor surgical procedures like D & C, therapeutic abortion or vaginal plastic repair has been reported as 1.0, 1.28 and 2.2% by Boysen and McRae (1949), Lee *et al.*, (1951) and McMaster and Ansari (1971).

On reviewing the literature regarding the psychological sequelae one finds a variety of divergent opinions. Peel and Potts (1969) stated that termination probably had little effect on the course of common mental conditions like Schizophrenia, maniac depression, etc. Walter (1970) stated that legal abortions could be performed without any fear of severe psychic aberrations in women. We noticed one patient who developed bilateral T.O. masses following the operation of termination of pregnancy and vaginal sterilization. Later, she became psychotic and insisted that her pregnancy had not been terminated in spite of getting relieved of all her complaints. Ultimately she was cured with psychotherapy.

Summary

The principle and technique of suction aspiration for termination of pregnancy during the first trimester is presented and 408 cases subjected to termination

by vacuum aspiration are analyzed. Uterine aspiration was performed mostly (93%) before completing 10 weeks of pregnancy. As the majority (95%) of our patients were multiparae concurrent tubal ligation was carried out in 84% of the cases. Maximum number of cases were performed either under general or spinal anaesthesia but most of the cases in Group I were done under local anaesthesia in the form of paracervical block. The overall complication rate in Group I was 7.3%, but it nearly doubled (14.1%) in Group II where sterilization was combined with the termination of pregnancy. Common complications encountered were haemorrhage, retained products, pyrexia and pelvic infection. Furthermore, it was noticed that complications were more frequent when termination was done at a later period of gestation (after 6-8 weeks of pregnancy). It was least when pregnancies were terminated at 6 weeks and highest between 10-12 weeks of gestation.

Conclusion

From our experience, it can be proposed that vacuum aspiration should totally replace the conventional method of dilatation and curettage for abortion in the first trimester of pregnancy as it has got the following advantages over the latter.

1. It is less time consuming and can be carried out under any kind of anaesthesia.
2. It requires minimum dilatation of cervix, thereby decreasing the possibility of damage to the internal os.
3. Blood loss is minimum as the uterine cavity is quickly evacuated followed by rapid contraction of the uterus.
4. Risk of perforation and pelvic in-

fection is negligible.

Though Boysen and McRae (1949) and Lee *et al.*, (1951) after a short trial recommended that sterilization should be done several months after abortion we felt, as it was also observed by Sogolow (1971), that vaginal tubal ligation after abortion by vacuum aspiration was not difficult to perform before 10 weeks and identification of the tubes was not impaired by the recently pregnant uterus with its hyperaemia and oedema. The procedure deserves a wider trial by the gynaecologists.

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References

1. Boysen, H. and McRae, L. A.: *Am. J. Obst. & Gynec.* 58: 488, 1949.
2. Buckle, A. E. R. and Anderson, M.: *Brit. Med. J.* 2: 456, 1970.
3. Bykov, S. G. (1927): Cited by Eaton, J. C.
4. Cernuha, E. A.: quoted by Kerslake, D. and Casey, D.
5. Chalupa, M. *Zbl. Gynek.* 86: 1803, 1964.
6. Dvorak, Z., Truka, V. and Vasicak, R.: *Lancet.* 2: 997, 1967.
7. Eaton, J. C.: *J. Am. Med. Assoc.* 207: 1887, 1969.
8. Fort, A. T. and Alexander, A. M.: *Obst. & Gynec.* 28: 421, 1966.