

## Deaths Attributable to Tubal Sterilization - 1979 to 1999

Babu S. Patel, Nimish C. Pandya, Manish M. Jadav, Malvika K. Bhatt, B. S. Ankleshwaria

Sheth K. M. School of Post Graduate Medicine and Research, Smt. N.H.L. Municipal Medical College, Sheth V. S. Group of Hospitals  
Ellisbridge, Ahmedabad - 380 006.

### Summary

Family planning is more than an issue of safe motherhood or population growth control. Complications of unwanted pregnancy termination are likely to be responsible for half of the maternal mortalities in the world. Deaths due to family welfare programme is tragic, painful and unbearable as it is always premature & preventable.

We have presented this study of deaths attributable to tubal sterilization in order to determine why they occur & what may be done to prevent them. In last 20 years, 16 such deaths have been identified as occurring in our institution. Of these 16 deaths, six were due to sepsis, two were due to haemorrhage, three were due to pulmonary embolism & five deaths were related to other causes. Use of endotracheal intubation for general anaesthesia, particularly for laparoscopic sterilization, careful insertion of needle & trocar, strict follow up of standard infection control measure in & outside operation theatres, prophylactic use of broadspectrum antibiotics & discontinuation of oral contraceptive prior to sterilization may help to prevent sterilization attributable deaths.

### Introduction

Despite advanced communication technology and a world wide hunt for exciting stories, some tragedies do not attract much attention. In last 30 years, tubal sterilization is the most prevalent method of family planning, in India. Tubal sterilization, in general, is a safe operation but with serious complications occurring in approximately 2% of procedures. Despite the overall safety of these operations, deaths, though rare, do occur. About 4 - 19 / 100000 women undergoing tubal sterilization at different centers, do die in India. As such very few studies have been published about why such deaths occur and what may be done to prevent them.

This report details the circumstances of 16 such deaths that occurred in our institution while performing 77563 tubal sterilizations.

### Material & Methods

At our institution, tubal sterilization is a planned operation with all necessary investigations. When this type of accident occurs, being a national programme, it has to be reported to the government. For each death, a detailed clinical summary is prepared with cause of death, whether attributable to sterilization or not. This is a retrospective analysis of all these summaries of 16 deaths from April 79 to March, 99. Out of total 77563 sterilizations, 30% were laparoscopic sterilization.

Table : 1

Cause of death	Age	Surgical Procedure	Anaesthesia	Operation death Interval	Remarks
Sepsis	25	PPTL	SA	5 days	
Sepsis	27	CS+TL	SA	7 days	CS for Prolonged labor
Sepsis	28	PPTL	SA	6 days	
Sepsis	32	PPTL	SA	6 days	TL after 3 <sup>rd</sup> day of delivery
Sepsis	39	MTP + TL	SA	6 days	Laparotomy on 5 <sup>th</sup> day
Sepsis	30	MTP + TL	GA	8 days	H/O UTI Cystitis before 2 months. ARI
Haemorrhage	36	Int. LapTL	GA	3 hours	Laparotomy. Retroperitoneal Haematoma TL by Pomeroy method
Haemorrhage	30	MTP + LapTL	GA	4 hours	Splenic tear, Laparotomy Splenectomy. Obesity
Pulmonary Embolism	27	PPTL	GA	3 days	Home delivery
Pulmonary Embolism	29	Hyst + TL	SA	8 hours	
Pulmonary Embolism	32	Hyst + TL	SA	4 days	
Air Embolism	30	MTP + LapTL	GA	3 hours	Surgical emphysema
CVA + HI	25	PPTL	SA	5 days	LL Hemiplegia on 4 <sup>th</sup> day
Myocardial Infarction	30	PPTL	SA	11 hours	Autopsy - Massive MI
Superior mesenteric artery thrombosis	40	Hysterotomy + TL	SA	8 days	Intestinal obstruction Resection anastomosis
Allergic reaction to drugs	28	MTP + TL	SA	4 <sup>th</sup> day	Imp. Anxol + Fortwin LM

### Observations:

The causes of deaths were : Sepsis (6), Haemorrhage (2), Pulmonary embolism (3), Air embolism (1), Cerebrovascular accident & hypertension (1), Myocardial Infarction (1), Superior Mesenteric Artery Thrombosis & Paralytic Ileus (1) & allergic reaction to drugs (1).

**Sepsis :** Three women who died due to sepsis had delivered at hospital & tubal sterilization was done after 48 to 72 hours. They developed infection on 2<sup>nd</sup> or 3<sup>rd</sup> day of operation & died on 5<sup>th</sup> or 6<sup>th</sup> day due to septicaemia & endotoxic shock. One patient had emergency I.SCS for prolonged labor with sterilization operation. She developed sepsis on 2<sup>nd</sup> day & died on 7<sup>th</sup> day inspite of all measures. Of the remaining two deaths due to sepsis, one followed apparent injury to bowel during sterilization. The injury was not recognized until the patient was seriously ill. Surgical exploration revealed a 1cm defect in small bowel which might have been caused while opening the peritoneum. Another patient had a history of UFI who was investigated by USG & IVP before 2 months of operation and a diagnosis of cystitis was made. She developed signs of sepsis and Acute renal failure on 3<sup>rd</sup> day & died of endotoxic shock on 8<sup>th</sup> day. Autopsy might have helped to get more information.

**Haemorrhage:** Two deaths attributable to haemorrhage followed major vessel lacerations that occurred during laparoscopic sterilization. One had superior mesenteric

Artery laceration by Veres needle which was noted while introducing laparoscope. Immediate Laparotomy was done. There was a retroperitoneal haematoma, which was explored & suturing was done. As patient was stable, tubal ligation by Pomeroy method was done. But suddenly she developed cardiac arrest probably due to hypovolemic shock & died on table. 2<sup>nd</sup> death was due to splenic tear with trocar. It was a case of obesity with undiagnosed splenomegaly. Immediate laparotomy & splenectomy was performed but patient didn't recover.

**Pulmonary Embolism:** Three deaths were attributable to pulmonary Embolism. One was operated for Hysterotomy & Sterilization, who developed chest pain & shortness of breath & died within 8 hours of surgery. X-Ray confirmed the pulmonary embolism. 2<sup>nd</sup> patient was also operated for hysterotomy & sterilization. On 3<sup>rd</sup> day she developed shortness of breath and cyanosis. She was managed medically but died the next day. X-Ray chest was suggestive of pulmonary Embolism. 3<sup>rd</sup> patient was operated for Abdominal TL who had home delivery before 3 days. On 3<sup>rd</sup> day of operation she suddenly developed convulsion, cyanosis & breathlessness. She expired within 2 hrs. Clinical diagnosis of pulmonary embolism was made. Autopsy was advised in all these cases, but refused by relatives.

**Air Embolism:** This patient was operated for Laparoscopic Sterilization. During insufflation, air had gone extraperitoneally even up to neck, causing surgical emphysema. After completion of procedure, patient

suddenly developed cardiac arrest from which she could not be revived.

**Myocardial Infarction:** This obese patient was operated for abdominal sterilization. On 2<sup>nd</sup> day she developed chest pain, breathlessness & hypotension & died in the evening. ECG was suggestive of massive myocardial infarction. Autopsy confirmed the clinical diagnosis.

**Cerebrovascular accident & Hypertension:** This was known case of PHH who was operated for sterilization after 4<sup>th</sup> day of delivery as her B.P. was under control. On 4<sup>th</sup> day of operation she developed hemiplegia of left side & altered consciousness. CAT scan was suggestive of thrombotic changes in brain. She died the next day.

**Superior mesenteric Artery thrombosis:** She was operated for Hysterotomy with sterilization. On 3<sup>rd</sup> day she developed temperature, distension of abdomen & tachycardia. X ray was suggestive of intestinal obstruction. Exploratory Laparotomy was done on 5<sup>th</sup> day where small intestines were dilated & gangrenous. Superior mesenteric artery thrombosis was detected. Intestinal resection anastomosis was performed but she died on 8<sup>th</sup> day, probably due to electrolyte imbalance.

Allergic reaction to drugs: on 4<sup>th</sup> day of operation, this patient was given inj. Fortwin & Diazepam, I/M, for severe pain. After 1 hour she developed breathlessness & hypotension. All measures were tried but she died after 6 hours.

#### Discussion:

Approximately 4-100000 in USA & 10.4 / 100000 women in UK, undergoing tubal sterilization, do die (ACOG news lett, 1982). In India, as reported by different centers 4 to 19 / 100000 women do die due to tubal sterilization (Purandare & Patel, 1998). But both the British & the American surveys make one important observation. The documented death rate from elective sterilization is much less than the documented recurrent annual risk of death associated with oral contraception. Further, sterilization is a single incident in a woman's life & usually never repeated but taking oral contraception is a recurrent event going on for perhaps 20 years. Elective sterilization thus emerges as a safe alternative for a permanent method of sterilization (Chamberlain & Brown 1978).

In 1981, the CDC (Centre for Disease Control, USA) reported that complications of anaesthesia were the leading cause of abortion related deaths. Tubal

sterilization, like abortion, is generally an elective procedure performed on healthy young woman. While any surgical procedure carries certain risks, it appears that for tubal sterilization, like abortion, the greatest risk of death is that associated with anaesthesia used during procedure. Peterson has reported 11 deaths out of total 29 due to anaesthesia (Peterson et al, 1983). In our study, no death was directly related to anaesthesia complication.

In his study, Peterson et al 1983 reported 7 deaths due to sepsis out of total 29 deaths. Of these, 3 deaths were due to sepsis attributable to thermal bowel injury associated with the use of unipolar coagulating devices. In our institute unipolar coagulating method for sterilization was not used. In spite of aseptic & antiseptic precautions, prophylactic antibiotics, these patients developed deadly sepsis, which could not be controlled by any means. Endometritis is the most common cause of mortality & morbidity but majority of organisms causing it respond to routine antibiotics & so no organisms are found in cervical swab culture. Negative aerobic culture does not rule out endometritis as many pathogens causing endometritis are strict anaerobes, culture for which was not done in these cases.

Peterson et al 1983 has reported 4 deaths out of total 29 due to injury to major vessels. Major vessel lacerations are a catastrophic consequence of laparoscopic sterilization. Injury to large vessel is an acute emergency requiring an immediate laparotomy. The first step in management of this problem is to put out an emergency call for a vascular surgeon. The next step is to consider leaving the trocar & needle in place to make identification in a retroperitoneal haematoma more feasible. If it is a major aortic tear, an immediate laparotomy (without preparation) & pinching off the aorta above the tear with fingers are extreme but life saving measures to prevent excessive blood loss & maintain cerebral & renal perfusion. The spinal cord can sustain this anoxia for 30 to 40 minutes, after which lower limb paralysis will result, if the vascular surgeon has not placed an appropriate clamp around the vessel (Hulka et al, 1993). Insertion of the trocar & needle for Laparoscopy must be done with careful attention to landmarks & insertion techniques to prevent haemorrhage. Any abdominal organomegaly or mass should be ruled out, particularly in obese, if possible by pre-operative ultrasonography. Intra-peritoneal position of needle should be confirmed before insufflation of gas (CO<sub>2</sub>) & use of air should be avoided to prevent surgical emphysema or air embolism (Wadhwa et al 1978).

De Stefano has reported oral contraceptives to cause at least a three fold increase in the risk of post-operative thromboembolism, which may lead to pulmonary embolism, myocardial infarction or cerebrovascular accident (De Stefano et al, 1982). But in our study, we have no definite history of use of OC by these cases. But discontinuation of use of OC at least 1 month before major elective surgery is advisable

**References**

1. ACOG Committee on Gynecologic practice: ACOG news lett. 26:8, 1982.
2. Chamberlain G & Brown J C (eds). Gynecologic laparoscopy, London, P 153, 1978.
3. De Stefano, F, Peterson. H.B, Ory H W, Layde PM Am.J.Obstet. Gynecol. 143:227, 1982.
4. Hulka JF, Peterson H.B, Phillips JM, Surrey M J Reprod. Med. 38, 1993.
5. Peterson H. B, DeStefano F, Rubin GJ, Greenspan J. R. Am. J. Obst. Gyn 146:131, 1983.
6. Purandare C. N., Patel M.A. J of Obst Gyn of India, 48:6, 116-123, 1998.
7. Wadhwa, R.K, Mckenzie R, Wadhwa S, R.katz D, Byers JF, Anaesthesiology 48:74, 1978.