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Fertility outcomes following laparoscopic tubal re-anastomosis post tubal sterilisation

Philip Kaloo[1] and Michael Cooper[2]

Department of Obstetrics and Gynaecology, University of New South Wales;[1] Department of Obstetrics and Gynaecology, University of Sydney,[2] Sydney, New South Wales, Australia

INTRODUCTION

Despite tubal sterilisation being considered as an irreversible method of contraception, 1–2% of women will undergo subsequent tubal re-anastomosis.[1,2] Open microsurgical tubal re-anastomosis following tubal sterilisation has been performed for nearly 30 years[3] with recent pregnancy rates reported of 60–91%.[4] Laparoscopic tubal re-anastomosis was first described by Sedbon et al in 1989.[5] Initial reports of the technique were marred by poor pregnancy rates of 25–36%[5–8] and, with pregnancy rates following in vitro fertilisation (IVF) of 60–80%, surgical tubal re-anastomosis had to be considered inappropriate as a first line of management. More recently, however, with improvements in instrumentation and camera technology, several large studies have now shown pregnancy rates comparable to both IVF and open microsurgical techniques (71–91%).[9]

In addition to such inherent benefits of laparoscopy as reduced patient morbidity, shorter hospital stay and reduced costs,[10,11] laparoscopy has other specific benefits over open procedures such as minimisation of tissue desiccation and trauma and, therefore, subsequent adhesion formation.[12] Consequently the procedure of laparoscopic tubal reversal is becoming more widely accepted as the tubal reversal operation of choice.

The aim of this study is to determine the fertility outcomes following laparoscopic tubal re-anastomosis from one of the few Australian units regularly to undertake such surgery.

MATERIALS AND METHODS

A retrospective mail follow-up of consecutive subjects who underwent laparoscopic tubal re-anastomosis following tubal sterilisation was carried out. Subjects were derived from the practice of a specialist gynaecological endoscopist over a five-year period from August 1995 to December 2000.

Address for correspondence

Dr Michael Cooper
187 Macquarie Street
Sydney
New South Wales 2000 Australia

Philip Kaloo Gynaecology Research Registrar, Michael Cooper Senior Clinical Lecturer

The mailed pro-forma questionnaire collated information regarding dates of initial sterilisation and reversal, previous pregnancies, subsequent pregnancies and their outcomes or if unsuccessful any other form of infertility treatment. All data remained anonymous.

The surgical technique employed remained unchanged over the five-year period with one surgeon (MC) undertaking all of the procedures.Routine laparoscopy was performed with a 0°, 10 mm laparoscope. In all cases, the isthmic portion of the fallopian tube had been interrupted and the remainder of the pelvis was normal. A Valtchev uterine manipulator with a perforated end attachment (Surgical Specialists, Ermington, NSW) was used for uterine anteversion. A needle point electrode with a 'cutting' current was used to reflect the serosa and remove the clips if present. Methylene blue dye was then introduced through the Valtchev and the distal portions of the proximal tubes were excised with scissors allowing free flow of dye.

The proximal segments of the distal tubes were then identified and excised allowing clear inspection of the tubal lumens, maximising tube length. The tubal segments were realigned with minimal tension and re-anastomosis performed with three or four 6/0 proline sutures. The sutures were passed through the muscularis using laparoscopic needle holders (3 mm right-angled, Cook Australia, Qld, or Szabo-Berci, Storz, N Stenning & Co, New South Wales) and secured with intracorporeal knots.

Tissue manipulation was performed with 2 mm graspers (Tyco Healthcare, Mansfield, MA, USA). The uterine manipulator was then removed and the tubes left with no tension on the re-anastomosis. All subjects had two operable fallopian tubes. Meticulous haemostasis was observed throughout the procedure.

Subjects had routine postoperative care and were discharged the same day.

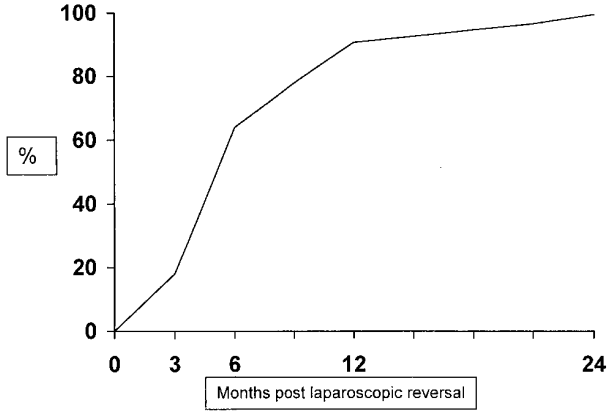
RESULTS

Twenty-four procedures were undertaken over the five-year period. Information on postoperative pregnancies and mail responses was available from 19 subjects. The average age of all subjects was 34.5 years (SD 4.5, range 26–43 years) with four subjects 40 years old or more. The average interval between sterilisation and reversal was 6.3 years (SD 3.1, range 3–12 years). Information with regards to parity was incomplete. No subjects had undergone any additional fertility treatment or surgery.

The mean operating time for all 24 subjects was 115 minutes (SD 28.3, range 90–200 minutes), all subjects having both fallopian tubes operable with > 4 cm of re-anastomosed tube at the end of all procedures. No significant concurrent pelvic pathology was noted. One subject had been sterilised via the Pomeroy technique, the remainder with Filshie clips. No major intra- or postoperative complications were experienced.

The mean time to pregnancy following reversal was 8.3 months (SD 6.6, range 1–24 months). This cohort yielded a pregnancy rate of 78.9% and a take-home baby rate of 68.4%. Two subjects became pregnant but miscarried in the first trimester and thirteen subjects had term pregnancies or are currently in their third trimester. No ectopic pregnancies were reported. The cumulative pregnancy rate is shown in Figure 1.

Figure 1 Cumulative pregnancy rate



DISCUSSION

The findings (pregnancy/take-home baby rate) of this short study are consistent with those published elsewhere and, importantly, compare favourably with both open microsurgical tubal reversal and IVF.[2] In contrast, earlier published reports of laparoscopic tubal reversal were marred by poor pregnancy rates of 25–36%.[5,6] However these were usually smaller, retrospective studies and as in Dubuissons one stitch technique study, involved techniques, that had not been validated previously in open cases.

This study has a relatively small population size but has a satisfactory response rate of 80%. If all of the non-responders are considered unsuccessful in becoming pregnant, the pregnancy rate/take-home baby rate remains 63% and 55% respectively; these findings are consistent with other larger published studies.[2]

No ectopic pregnancies were diagnosed in this group. This is consistent with the observed ectopic pregnancy rate following tubal re-anastomosis of between 2 and 7%.[2,9] Importantly, there remains no clear evidence that ectopic pregnancy rates are higher following laparoscopic or open reversal procedures.[2,4,9,13,14] The mean patient age and parity are similar to the demographics seen in other studies. Increasing maternal age is a well-known factor affecting fertility, which declines significantly after 35 years. Consequently, it also has a highly significant and negative effect on the pregnancy rate post tubal reversal.[15] In this study, of the four women aged 40 years or more, only one became pregnant. Two of the remaining three subjects underwent hysterosalpingography showing bilateral patent fallopian tubes. The size of this study, however, precludes any conclusions being made correlating the outcomes with maternal age. Nonetheless, statistically significant reductions in fecundity over the age of 40 have been reported in large studies following tubal reversal.[4]

The cumulative pregnancy rates seen in this study (85% at one year) reiterates findings elsewhere that the procedure is unlikely to have a successful outcome more than one-year post reversal,[4] cumulative pregnancy rates at 12 months being reported at 80–91%.[2,4]

The surgical technique used is similar to most published open and laparoscopic procedures and remained essentially unchanged over the five-year study period. There remains a large array of alternative methods for tubal re-anastomosis, ie one, two or three suture techniques,[8] using an intra-luminal stent with tissue glue[7] or additional sutures and the use of titanium staples,[11] with, as yet, no clear benefits over the technique described above.

A major difficulty associated with laparoscopic tubal reversal is the degree of skill which the procedure requires; these are skills that not all gynaecologists have developed. The procedure is highly demanding in terms of the skill and concentration required from the surgeon and the assistant and can have a duration comparable to that of open procedures.[8]

New technologies in the form of enhanced camera resolution, improved instrumentation and the use of robotics may shorten and make the procedure less technically demanding.

Newer reversible long-term and irreversible methods of contraception being introduced may well reduce the number of laparoscopic sterilisations and hence the number of reversals being performed.

CONCLUSIONS

Laparoscopic tubal re-anastomosis has a pregnancy rate and take-home baby rate similar to that seen with open procedures. With the addition of the well-documented benefits of laparoscopic surgery, laparoscopic tubal re-anastomosis in skilled hands can be considered, at least, as an appropriate alternative to an open procedure.

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