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Spontaneous pregnancy rates after reproductive surgery

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KEY MESSAGE

Spontaneous pregnancy rates after reproductive surgery are relatively high, and therefore the role of surgery in the treatment of infertility should be re-evaluated.

A B S T R A C T

With the development of IVF procedures, the role of reproductive surgery in the management of infertile couples has been questioned. Pregnancy rates (PR) after IVF procedures are well known, but recent data on spontaneous PR after reproductive surgery are scarce. This study aimed to prospectively evaluate how often fertility is restored by reproductive surgery and to identify which independent factors influence spontaneous pregnancy after reproductive surgery. Eight hundred eighty-eight infertile women who underwent surgery for infertility were prospectively included. Women who were referred to IVF after surgery, ceased to plan pregnancy and were lost to follow-up were excluded. Spontaneous PR was analysed for 519 women. A total of 252 (48.6%) women, including 30 treated with clomiphene citrate, conceived spontaneously in the 12–18 months observation period following surgery. Multivariate logistic regression showed that woman's age (OR 0.95, 95% CI 0.90–0.99) and duration of infertility (OR 0.86, 95% CI 0.74–0.99) significantly influence spontaneous PR. Each year of infertility lowers spontaneous PR following surgery by 14% and each year of woman's age by 5%. The study shows a relatively high percentage of women conceived spontaneously after reproductive surgery. The role of reproductive surgery in the management of infertility should be re-evaluated.

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Introduction

Counselling an infertile couple starts with a careful medical history, semen analysis, transvaginal ultrasound, serum hormone concentration analysis and sometimes a tubal patency test. After the results of these tests are known, a decision is made whether to refer the woman to reproductive surgery or to advise the couple to progress to an assisted reproductive technique.

Until a few years ago, endoscopic surgical procedures were considered a gold standard for infertility investigation as they are minimally invasive and serve as a diagnostic and therapeutic method at the same time (Yanamandra and Gundabattula, 2015). They can be used as a primary treatment of infertility as well as to enhance outcomes in IVF procedures. However, with the development of IVF procedures, the role of reproductive surgery has been questioned (Erel and Senturk, 2005; Feinberg et al., 2008). There is an opinion that investigations of infertile couples should be fast and cheap (Gomel and McComb, 2010) and therefore, reproductive surgery should only be performed as an initial part of infertility evaluation in cases where there is a suspicion of underlying gynaecological pathology according to the woman's history and initial examination (Bosteels et al., 2007). On the other hand, it has been reported that careful selection of patients for reproductive surgery enables couples to conceive spontaneously and yields high cumulative pregnancy rates (PR) (Gordts, 2013).

Pregnancy rates after IVF procedures are well known because European IVF centres report them to European IVF Monitoring (EIM). At our department, verifying PR after IVF procedures several times a year has become part of the routine. We believe this approach is necessary for maintaining the quality of the IVF programme. Analysing PR after IVF procedures is relatively easy in comparison to analysing spontaneous PR after surgery for infertility. In an IVF programme, the feedback information comes back after 2–3 weeks, whereas after reproductive surgery the time period is measured in months or years in cases where spontaneous conception is expected. Pregnancy rates after reproductive surgery are usually known for groups of patients with particular diagnosis, for example different stages of endometriosis, polycystic ovary syndrome (PCOS) or unexplained infertility (Lee et al., 2013; Shimizu et al., 2011; Yanamandra and Gundabattula, 2015). Taking into account the longer expectation period for feedback information, it is understandable that analyses considering spontaneous PR after reproductive surgery are usually retrospective and include a relatively small number of patients.

Continuous monitoring of IVF success rates on the one hand and a lack of continuous verification of pregnancy rates after surgery for infertility on the other hand has led us to design a computerized database that enables periodic verification of PR after reproductive surgery. The database contains a meticulous medical history, preoperative clinical assessment, detailed description of the performed surgical procedure and operative diagnosis; these are all recorded at the time of surgery. Pregnancy data are added to the database after a 12–18-month observation period. The database therefore enables us to verify surgical work as part of quality control management.

In our institution, a woman is referred directly to IVF only if there is an obvious indication for IVF such as male factor of infertility, inoperable bilateral tubal factor and the need for preimplantation genetic diagnosis. Women aged 38 years or over can decide for IVF without previous diagnostic laparoscopy if an ultrasound scan shows no pathology that indicates operative treatment. Women younger than 38 years are always referred to diagnostic laparoscopy, despite a normal ultrasound scan and normal partner's semen analysis. In case of previous spontaneous abortions or ultrasound suspicious for intrauterine pathology, hysteroscopy is performed as part of the same operative procedure.

The aim of the present analysis was to prospectively evaluate how often fertility is restored by reproductive surgery alone and how many couples still need to be referred to an IVF programme. Furthermore, this study aimed to identify which parameters best predict spontaneous PR after reproductive surgery.

Materials and methods

Computerized database

Some data that are prospectively collected include:

- general patient information (patient's name, date of birth, address, phone and e-mail, body weight and height)
- medical history (chronic illnesses, previous non-gynaecological surgical procedures)
- gynaecological history (previous pregnancies with outcomes, menstrual cycle, gynaecological ultrasound, previous surgical procedures)
- duration of infertility, semen and hormone analysis, results of a tubal patency test if performed, previous IVF cycles or treatment with clomiphene citrate, previous use of hormone therapy
- data about the performed operative procedure according to the diagnosis:
- fibroids: number, location, size of fibroid(s) and type of operation
- endometriosis: peritoneal, ovarian (unilateral or bilateral and size of endometriomas), deep infiltrating endometriosis (DIE), rAFS stage (ASRM, 1996) and Enzian stage for DIE (Haas et al., 2011)
- tubal factor: status of each tube (classified using rAFS classification; ASRM, 1988) and procedure performed
- PCOS: with performance of laparoscopic ovarian drilling
- ovarian cysts (excluding endometrioma):size and histological type
- congenital uterine anomalies (classified using rAFS classification; ASRM, 1988) and procedure performed
- endometrial polyps: size and number
- intrauterine adhesions with stage of Asherman's syndrome
- other (descriptional)

Patients

Between June 2012 and December 2013, 888 patients were operated due to infertility at the Department of Human Reproduction, Division of Obstetrics and Gynaecology, University Medical Centre Ljubljana, Slovenia. After the procedure, the woman's potential for spontaneous conception was evaluated; patients where spontaneous conception was not expected (male factor infertility, bilateral tubal damage, the need for preimplantation genetic diagnostic) were referred directly to IVF.

Out of 888 operated women, 238 were immediately referred to IVF. This group of women consisted of those with an additional male factor of infertility (n = 140), bilateral tubal damage (n = 47) and women who already had previous unsuccessful IVF and pathology that demanded surgical treatment prior to the next IVF was seen on ultrasound (intracavitary fibroids, polyps, sactosalpinx) (n = 51). Among

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