Operative laparoscopy for ectopic pregnancy: how experienced should the surgeon be?

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The purpose of this study was to assess the efficacy of laparoscopic surgery for ectopic pregnancy in a general hospital in Paris, where most of the surgeons are still in training. During a period of 20 months, 100 cases of ectopic pregnancy were diagnosed and treated by the attending residents. Nine cases required a laparotomy due to heavy bleeding or interstitial ectopic pregnancy. Most of the other cases were treated laparoscopically, with either salpingectomy (70 cases) or linear salpingostomy (19 cases). Complications of the laparoscopic surgical procedures were rare. There was one failure of linear salpingostomy that required a second intervention (5.3% failure rate); there was one case of urinary retention that resolved after 48 h; and one case of fever above 38°C that responded well to antimicrobial therapy. In conclusion, we have shown that the current notion that laparoscopic surgery is preferred to conventional abdominal surgery for the treatment of ectopic pregnancy, can be applied to a public gynaecological centre with young inexperienced residents, supervised by experienced gynaecologists.

Key words: ectopic pregnancy/laparoscopy/salpingectomy/salpingostomy

Introduction

The management of ectopic pregnancy has evolved considerably in the last decade, both due to the use of efficacious diagnostic means, and due to new therapeutic, medical and surgical techniques. The use of high-resolution vaginal ultrasound and highly sensitive assays of β-human chorionic gonadotrophin (HCG) in serum has rendered the early detection of the condition possible, and in turn has allowed for early laparoscopic diagnosis and treatment (Li et al., 1991). The classical role of laparoscopy as a diagnostic tool has been widened to include either surgical salpingectomy and salpingostomy or non-surgical intra-uterine instillation of methotrexate or other agents. Other modes of treatment include expectant management or systemic methotrexate given either per os (p.o.) or i.m. The choice between conservative or radical modes of treatment depends mainly on the patient’s desire for children and on the state of her tubes.

Most authorities who favour the use of laparoscopic surgery for the treatment for ectopic pregnancy base their recommendation on the reported success of several well-established centres for this technique (Pouly et al., 1986; Reich et al., 1988; Mecke et al., 1991; Grimes, 1992). Our aim, in the present study, was to analyse the last 100 cases of ectopic pregnancy in a busy general hospital in Paris in order that the success rate of these new surgical techniques, in a public gynaecological service in which most of the surgeons are still in training, may be compared to that of the well-established centres cited above.

Materials and methods

From March 1991 to October 1992, 100 cases of ectopic pregnancy were diagnosed and treated in Tenon Hospital in Paris (out of 118 laparoscopies performed due to suspected ectopic pregnancy). Most of the patients were self-referred to the emergency unit, but some were referred by their physicians. Their mean age was 32 years (range 18—46 years). The attending resident doctors, supervised by one of two chief residents, were responsible for the patients’ physical examination, sonographic evaluation, serum βHCG tests, and the laparoscopic diagnosis and treatment. During the period of the study two chief residents were working in the department. They both had 2 years’ experience in laparoscopic surgery at the onset of the study. The residents, who stayed in the department for periods of 6 months at a time, and were mostly young and inexperienced, operated on 94% of the ectopic pregnancies with the help of one of the chief residents. Sonographic examination in all patients used a vaginal transducer with an emission frequency of 5.0 MHz. Serum βHCG concentration was determined pre-operatively for all patients and at least twice post-operatively for the patients who had a conservative procedure.

Ectopic pregnancy was suspected when stagnation of serum βHCG values occurred concomitantly with clinical evidence of ectopic pregnancy, sonographic criteria such as the lack of a gestational sac in the uterine cavity, or the demonstration of such a sac outside the uterus. The final diagnosis was made laparoscopically, which usually served for the surgical treatment as well.

Operative laparoscopy included, in most cases, a three-puncture technique. The primary cannula, with the laparoscope and video camera, had already been placed for the diagnostic laparoscopy through an infra-umbilical incision, and the two 5 mm secondary cannulae were inserted medial to the deep epigastric vessels. Sometimes a fourth cannula (5 mm) was placed in the mid-line, superior to the urinary bladder to facilitate handling of the tube. After inspection of the pelvic organs and suctioning of blood,
when present, the size and site of the pregnancy was identified and the mobility of the tube was assessed.

In those cases where pregnancy was desired, and where the tubal pregnancy was small and unruptured, and the tube was mobile, a linear salpingostomy was chosen, usually by a monopolar incision along the antimesenteric border overlying the ectopic pregnancy. However, most of the cases were unsuitable for conservative surgery, and a laparoscopic salpingectomy was performed. The technique included stabilizing the tube with grasping forceps, coagulating the mesosalpinx just beneath the tube using bipolar Kleppinger forceps, dissecting the coagulated area until 2–3 mm from the uterine horn, and finally removing it by easing it out through a 10 mm cannula. Meticulous inspection and irrigation of the operation site was the rule for both conservative and radical operations. Patients who had normal post-operative recovery were discharged after 24–48 h.

Results

Out of 100 patients, 91 had an ectopic pregnancy in the ampullary portion of the tube, six were in the isthmic portion, two were interstitial and one was ovarian. One of the isthmic pregnancies was situated in the stump of a previous monopolar laparoscopic salpingectomy. Six had an associated intra-uterine device. Ultrasonography established a positive diagnosis by demonstrating an extra-uterine gestational sac in 11 cases. In the other patients it demonstrated the lack of an intra-uterine pregnancy, except in one case where an intra-uterine sac was observed but was later diagnosed as a pseudogestational sac with an associated tubal pregnancy. About half of the patients had an infertility problem, and nine had conceived by an in-vitro fertilization (IVF) treatment. Out of 12 patients who had a previous ectopic pregnancy, 11 had a previous salpingectomy. Mean serum βHCG concentration was 2460 mIU/ml (range 47–13 900 mIU/ml) for the non-Interstitial ectopic pregnancy and 73 000 mIU/ml and 41 870 mIU/ml for the two interstitial pregnancies. Eight patients had dilatation and curettage at the time of laparoscopy.

Laparotomy was performed in nine patients. Seven of them underwent a salpingectomy due to severe bleeding, with either a ruptured tube (five cases) or a fissurized tube (two cases). In the remaining two patients a laparotomy was necessary due to an interstitial ectopic requiring a cornual resection. There were 13 other cases of ruptured tubes that were managed successfully by laparoscopic salpingectomy. Two patients had a blood transfusion due to severe pre-operative bleeding of 2.5 l of blood, and they both received six packs (3 l) of blood. Patients with less severe bleeding (up to 1.5 l with a corresponding haemoglobin of 5.8 g/dl) were not transfused.

Radical laparoscopic surgery was performed in 70 cases, and included a salpingectomy in 69 patients, and an isthmectomy in a patient who had an ectopic pregnancy in the stump of a previous salpingectomy. Two of the salpingectomies were performed after failed conservative methods. Conservative laparoscopic treatment was undertaken in 24 patients and included the following procedures: 19 linear salpingostomies, two pregnancy aspirations (of an aborted fimbrial ectopic pregnancy and an ovarian ectopic pregnancy), and three local injections (of methotrexate and...
ampullary pregnancy, and either linear salpingostomy or
hyperosmolar glucose (Lang et al., 1989), local injections of
methotrexate, or potassium chloride (Robertson et al., 1988; Mecke et al., 1991). In our series, nine patients (9%) underwent a
laparotomy after a laparoscopic diagnosis of ectopic pregnancy. We assume that two local injections were performed, and a salpingostomy was always the rule. Five of these patients had a ruptured tube and two had a fissurized tube. As most of the patients who had a ruptured tube were haemodynamically unstable, the choice between open or laparoscopic salpingectomy was most often made by the anaesthetist who sought a rapid procedure. However, when the experience of the surgeon allowed for a fast laparoscopic surgery, it was sometimes performed even in cases of moderate to severe bleeding. In our study, there were 13 cases of a ruptured tube which were successfully operated laparoscopically.

Conservative, non-surgical modes of treatment include expectant management (Pansky et al., 1991; Ylöstalo et al., 1992), local or systemic administration of methotrexate (Pansky et al., 1989; Stovall et al., 1991), local injections of prostaglandins (Lindblom et al., 1987; Egarter et al., 1989), hyperosmolar glucose (Lang et al., 1992) or potassium chloride (Robertson et al., 1987), and aspiration in cases of tubal abortion. Surgical conservative techniques include linear salpingostomy for ampullary pregnancy, and either linear salpingostomy or segmental excision for isthmic ectopic pregnancy. All of these methods require a close follow-up of $\beta$HCG concentrations in order to ensure that there is no proliferation of remaining trophoblastic tissue.

Experience needed for operative laparoscopy

In our series only 24 patients (24%) had conservative treatment, as compared with 50–84% in other series (Li et al., 1991; Mecke et al., 1991). The cause of this low rate of conservative treatment can largely be attributed to the characteristics of the hospital’s population, of which a large part consisted of new African and Asian immigrants who had a low socio-economic status. These patients presented a problem of high incidence of post-infectious tubal adhesions which often necessitated radical surgery, a procedure which has recently been advocated for these cases (Chapron et al., 1992b). Furthermore, many of them have demonstrated lack of adherence to a strict follow-up regimen, thus reducing the possibility of conservative treatment. Other important reasons why radical treatment predominated include the high success rate of the IVF programme in the hospital, which was hindered by the large number of ectopic pregnancies post-IVF (nine cases in our series). Finally, a less experienced surgeon has a natural psychological tendency to resort to a definite operation which can prevent a recurrence, rather than chance a procedure that can be criticized in case of failure. Review of the literature demonstrates conflicting reports concerning pregnancy rates following conservative versus radical surgery. While some classic studies have shown higher pregnancy rates following conservative treatment (Novy, 1983), more recent work has demonstrated an improvement of pregnancy rates in both conservative and radical surgery, with no significant difference between the two (Thorburn et al., 1988; Tuominen and Kauppila, 1988; Langer et al., 1990).

As mentioned above, only three local injections were performed (two of methotrexate and one of glucose 50% solution). This small number of cases makes an analysis of the high failure rate (two out of three) irrelevant. However, we can analyse the reason for the rare choice of this mode of treatment. We assume that once a laparoscopy has been undertaken, and an ectopic pregnancy which can be treated conservatively has been diagnosed, it seems inappropriate to most of our young surgeons to leave trophoblastic tissue in the tube, rather than to perform a salpingostomy.

Failure rate (persistent ectopic pregnancy) of linear salpingostomy in our study was 5.3%. In some other series it ranged from 4% to 25% (Henderson, 1989; O’Shea and Thomson, 1990; Seifer et al., 1990; Chapron et al., 1991, 1992a; Zouves et al., 1992). On the other hand, the efficacy of local injections of methotrexate is still controversial (Mottla et al., 1992). Several authors have suggested that failure of conservative techniques is associated with a high serum $\beta$HCG concentration (Lang et al., 1992; Ory, 1992). We found that the patients who underwent linear salpingostomy had a mean $\beta$HCG concentration of 728 mIU/ml (range 122–2500), which was lower than the mean of the entire group (2460 mIU/ml). Unexpectedly, however, the single failure occurred in the patient with the lowest $\beta$HCG concentration (12 mIU/ml). A similar observation was reported by Seifer et al. (1990). As stated above, other complications were rare and there were no cases of post-operative bleeding. Such results are similar to previous reports (Pouly et al., 1986; Reich et al., 1988; Mecke et al., 1991).

A recent review of laparoscopic surgery showed that ectopic
pregnancy is one of the few indications for which there is sufficient evidence to recommend laparoscopic treatment (Grimes, 1992). Although this recommendation was based on studies from well-established centres, we have shown that it can also apply to a general hospital with surgeons that are still in residency.

References


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