

Conservative Management of Ovarian Torsion

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ABSTRACT

Ovarian torsion is a common gynaecological emergency, affecting women of all ages, with a peak incidence around the age of 30. Risk factors include enlarged ovaries secondary to ovarian cysts, ovarian hyperstimulation syndrome and ovulation induction, as well as tubal ligation and pregnancy. Diagnosis is primarily clinical, with laboratory and imaging investigations providing further support. Current management primarily consists of oophorectomy, although there is a trend towards preserving ovarian tissue through a combination of detorsion, ovarian cystectomy and oophoropexy. There is increasing evidence that necrotic appearing ovaries that do not appear to recover immediately following detorsion can still be viable in the long term. Furthermore, a policy of ovarian conservation for all pre-menopausal women with ovarian torsion appears to result in very good outcomes and low rates of complications, suggesting that oophorectomy should be reserved primarily for post-menopausal women.

Keywords: Ovarian torsion; Oophoropexy; Conservative management; Detorsion; Oophorectomy

INTRODUCTION

Ovarian torsion is the twisting of the ovary around its suspensory ligamentous structures, initially impeding lymphatic and venous outflow. This causes ovarian enlargement through oedema, subsequently leading to compression of the arteries that causes ischemia with potential progression to necrosis [1-3]. It is a gynaecological emergency thought to be responsible for up to 3% of cases of acute abdominal pain presenting to the emergency department, in both adults and children [4,5].

EPIDEMIOLOGY AND RISK FACTORS

Risk factors include post-tubal sterilisation, known ovarian cysts, and pregnancy-with odds ratios of 30.5, 18, and 15 respectively [6]. Women who are around 30 years old appear to have the highest rates of ovarian torsion, although it can occur at any age [6,7]. The length of the ovarian ligament is correlated with the risk of ovarian torsion-with a prospective cohort study finding that women with ovarian torsion have right ovarian ligaments that are nearly 50% longer than the control group [2]. Torsion is about 1.5 times more likely to occur on the right ovary than the left. One reason may be because the right ovary is near relatively mobile structures-the cecum and ileum-while the left ovary is near the sigmoid colon which is comparatively immobile. Other risks that have been discussed in the literature include ovulation induction, ovarian hyperstimulation syndrome, and polycystic ovarian syndrome [4].

CLINICAL PRESENTATION

Patients with ovarian torsion present with acute onset of abdominal pain, usually unilateral in nature. The pain may be constant, or intermittent, reflecting cycles of torsion and detorsion, and may be preceded by a history of similar episodes in the past reflecting partial and transient torsion [4]. In a series of 87 women with surgically confirmed ovarian torsion, 70% exhibited nausea or vomiting, 59% described a sudden onset, 70% described a sharp or stabbing character of pain while 44% described the pain of a crampy or colicky character. It was also found that 51% had pain radiation to the flank, groin, or back, 43% reported prior episodes of pain and 82% graded the severity as moderate to severe. Nearly half of the women presented to an emergency department within 12 hours of the onset of pain, while 2% of patients had pain lasting in excess of 150 days before presentation to ED, with the presumptive diagnosis of chronic pelvic pain [8]. With prolonged torsion, the ovary may become necrotic and be reflected in signs of peritonitis, although this is rare. Physical exam may reveal a low-grade fever, tachycardia and elevated blood pressure, as well as tenderness in the lower abdomen and flank regions. Common differentials include appendicitis, ruptured ovarian cyst, pelvic inflammatory disease, nephrolithiasis, pyelonephritis, ectopic pregnancy, colitis, and necrosis of leiomyoma, due to their similar clinical presentations [4].

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INVESTIGATIONS AND IMAGING

Laboratory investigations usually involve a complete blood count, electrolyte values and a pregnancy test to exclude ectopic pregnancy. Most patients have normal laboratory results although a slight leucocytosis may be present in up to half of the patients [4]. Imaging is primarily achieved through ultrasonography, through either a transvaginal or transabdominal approach. The most common sonographic sign is asymmetric ovarian enlargement to greater than 5 cm, while obstruction to venous outflow can manifest in stromal edema, and heterogenous appearance of the ovary. Compromised arterial flow may be observable through abnormal Doppler tracings-although normal Doppler tracings do not exclude torsion, as abnormalities are only observed in about half of all cases. The 'whirlpool sign' is another sonographic finding that may be present, although it cannot be reliably obtained in all cases. Conversely, free pelvic fluid is another finding that may be present, although it is quite non-specific for ovarian torsion [3]. Certain signs may also be observed on CT, including ovarian enlargement, decreased adnexal enhancement following IV contrast. MRI is not commonly used as a first line imaging modality, although may be used in equivocal cases to identify origin of masses, rule in or out alternative causes of pain, and identify ovarian haemorrhage [3]. Accurate diagnosis of ovarian torsion is difficult, with one centre reporting that only 44% of emergency laparoscopies due to acute abdomen were correct for ovarian torsion [9].

CURRENT MANAGEMENT

The traditional choice of treatment for ovarian torsion is oophorectomy as opposed to detorsion, due to the theoretical risk of thromboembolic events following detorsion, as well as peritonitis or infection due to the presence of a necrotic ovary in the abdomen. However, rates of conservative ovary-sparing management are rising, as well as recognition of its benefits over oophorectomy-with rates increasing from 20% of all cases of ovarian torsion managed surgically in 2001 to slightly over 25% in 2015 in the USA. Conservative procedures revolve around access to the abdominal cavity through either laparotomy or laparoscopy, detorsion and restoration of normal vascular supply to the ovaries, and may involve oophoropexies or cystectomies [1].

IMPACTS OF OOPHORECTOMY

The main drawbacks to oophorectomy result from its impact on fertility. In the case of a woman requiring two oophorectomies throughout her lifetime, the impact is direct in that the woman will not be able to conceive naturally and will also experience a menopausal state [10]. If the double oophorectomy occurs before puberty, it will cause abnormal sexual development, primary amenorrhea and primary infertility [11]. These risks must be considered before performing the first oophorectomy on a patient, and should be avoided if possible. Women with only a single ovary also experience reduced fertility, through a depleted ovarian reserve-determined through higher basal serum FSH levels, lower AMH levels and poorer response to stimulation. These women are also at risk of early menopause, and therefore a reduced reproductive lifespan [10]. In the case of assisted conception, women with a single ovary are less responsive to ovarian stimulation, although various studies point to a relatively comparable rate of successful pregnancy once embryo transfer has occurred [10]. The sum of these risks are reflected in the differing rates of conservative management of ovarian torsion across different ages-children under 15 are treated

conservatively 40% of the time while this figure drops to 20% in women who are 35, and under 5% in women who are over 50 [1].

CONSERVATIVE MANAGEMENT

A major reason for the increasing uptake of conservative management of ovarian torsion is increased recognition of the safety of the procedure and the very high rates of ovarian viability following detorsion. In fact, several investigators have examined the consequences of treating every single patient conservatively without exception. In one hospital, all children with ovarian torsion were treated conservatively, and 12 out of 13 (92%) ovaries exhibited good vascularity and follicular development on follow up ultrasonography. These promising results occurred despite over three quarters of these ovaries being reported as either brown to black with a slight improvement in colour following detorsion, or completely black with no improvement in colour following detorsion and hematoma evacuation [12]. Another hospital which routinely treated all pre-menopausal women conservatively reported a series of 102 women who were found to have black-bluish ovaries at the surgery. Out of those 102 women, 92 were assessed by ultrasound 8-10 weeks after detorsion, and 85 out of these 92 women (92%) were found to have remaining follicles in the treated ovaries, demonstrating that their ovarian function had been salvaged. Furthermore, in the women who had non-viable ovaries left in the abdomen, there were no reports of further injury to the patient that occurred as a result of the conservative approach. Six patients underwent IVF using oocytes from the previously ischaemic ovary and were successfully fertilised, a clear demonstration of preserved ovarian function despite the history of ovarian ischemia and injury [13]. Moiety (2017) has reported another series of 48 cases of ovarian torsion managed conservatively [14]. Notably, the author has reported that laparoscopies were performed on all women with no conversion to laparotomy, and every single ovary treated was conserved and salvaged. This was confirmed through Doppler ultrasonography and observation of normal ovarian volume and follicular development, at 1, 6, and 12 months following treatment, as well as second look laparoscopy in 16 cases [14]. In a database of over 150,000 women treated for ovarian torsion, approximately a quarter of whom were managed conservatively, it was found that conservative management was not associated with increased risk of venous thromboembolism, sepsis or systemic inflammatory response syndrome, or any complications in general [1]. Therefore, it is clear that a policy of conservatively managing all pre-menopausal women with ovarian torsion could result in high rates of preservation of ovarian function while having lower rates of complications.

CONCLUSIONS AND RECOMMENDATIONS

Ovarian torsion is a common gynaecological emergency that currently results in high rates of oophorectomy. Increasing evidence suggests that a policy of detorsion for all pre-menopausal women may be more optimal, due to the high rates of ovarian preservation that are possible, and low risk of complications. Further research into this area may be useful towards changing current surgical practices and improving outcomes for women who face this condition.

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