

Laparoscopic treatment of acute abdominal/pelvic pain for gynaecological condition in young female

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ABSTRACT

Introduction

The aim of this study was to report our experience with acute abdominal/pelvic pain in young female.

Materials and Methods

We recorded the cases of female patients aged between 3 and 16 years treated at our Institution for acute abdominal/pelvic pain between January 2005 and December 2013. Radiological and surgical findings were recorded; medical charts were reviewed; inclusion and exclusion criteria were made.

Results

During the study period data of 24 patients were studied. The overall mean age in our series was 10.6 years (range 3-16 years) with a mean time of symptoms of 2.7 days (range 1-10 days). Pelvic abdominal ultrasound was used for all patients; only one patient had magnetic resonance imaging. Surgical findings: 7 (29%) patients had a paraovarian/tubal cyst torsion, 3(12,5%) patients had ovarian cyst torsion, 11 (46%) patients had ovarian/tubal complex torsion and 3(12,5%) patients had isolated tubal torsion.

Conclusions

Acute abdominal/pelvic pain in young female is difficult to treat; this study demonstrates that there are many different conditions to consider when studying young patients, i.e. isolate Fallopian tube torsion and paratubal cyst torsion.

1. INTRODUCTION

Introduction

Diagnosis of acute abdominal pain in young female is sometimes difficult; Obstetrics and gynaecological conditions and appendicitis are common causes of acute lower abdominal pain in this population. [1-2]

Accurate diagnosis is critical since misdiagnosis could lead to unnecessary surgery or delayed diagnosis results in delayed management of urgent condition.

Acute surgical emergencies of gynaecological origin occur for the most part in women of reproductive age but also in newborn and adolescent patients; in general the most common important conditions to be considered in the pediatric and adolescent age include pelvic inflammatory disease with abscess, ectopic pregnancy, hemorrhage from a functional ovarian cyst and adnexal or ovarian torsions. [1]

Laparoscopy is ideal for the diagnosis and treatment of acute pelvic and abdominal pain and the treatment of gynaecologic emergencies[3].

The aim of this study is to report our experience in the treatment of acute abdominal pain related to gynaecological condition in pediatric age.

2. MATERIALS AND METHODS

Materials and methods

We recorded the cases of female patients aged between 3 and 16 years treated at our Institution for acute abdominal/pelvic pain between January 2005 and December 2013. Radiological and surgical findings were recorded; medical charts were reviewed; approval from the Institutional Review Board was obtained prior to chart review.

Inclusion criteria for the study were female gender, ages 3-16 years old, abdominal /pelvic pain and surgical treatment; exclusion criteria included appendicitis, gastrointestinal malformation, urological disease, trauma. We excluded patients aged less than 3 years to avoid negative patient collaboration during the visit (for pain localization and presentation of symptoms). All patients underwent abdominal ultrasound and blood tests (also for common tumor markers) in the emergency room; only 1 patient underwent magnetic resonance imaging (MRI). Medical charts were reviewed to identify demographic and clinical information at the presentation (age, time of symptom presentation, location of pain, nausea and vomiting, white blood cell count and C-reactive protein), ultrasound findings and intraoperative diagnosis.

Statistical analyses were performed using the Chi-square and Fisher's exact test with a p value less than 0.05 considered as significant.

3. RESULTS

Results

During the study period, after recording data, 32 female patients were treated for acute abdominal/pelvic pain. Of these patients, 24 were considered for the analysis; the other 8 were excluded (all these patients had intra-operative diagnosis of acute appendicitis). Patients were treated with laparoscopic approach using three 5 mm ports and 30 degree camera. None of our patients were converted to laparotomy.

The overall mean age in our series was 10.6 years (range 3-16 years) with a mean time of symptoms of 2.7 days (range 1-10 days). 9 patients had regular menstrual cycle while

6 patients reported irregular menstrual cycle. Acute abdominal pain was the predominant symptoms, and 15 patients reported also vomiting (more than 3 episodes) while all others reported only nausea. All patients were afebrile; 8 patients had leukocytosis (mean $18,3 \times 10^9/L$) (reference range: $4-10 \times 10^9/L$) with high level of C-reactive protein (mean $17,2 \text{ mg/L}$) (reference range $< 3 \text{ mg/L}$); 1 patients had only leukocytosis ($15 \times 10^9/L$) and 2 patients had only high C-reactive protein (one patient had 7 while one 40 mg/L).

Pelvic abdominal ultrasound was used for all patients; only one patient underwent abdominal magnetic resonance imaging (MRI) in another hospital.

Surgical findings: 7 patients had a paratubal cyst torsion, 3 patients had ovarian cyst torsion, 11 patients had ovarian/tubal complex torsion and 3 patients had isolated tubal torsion. 16 (67%) cases on the right side and 8 (33%) cases on the left side, with a ratio of 2:1.



Figure 1 Para-ovarian cyst torsion: laparoscopic view resection.

Paratubal cyst torsion: (Figure 1) 7 (30%) cases, 4 cases in the right side and 3 cases in the left side. Ultrasound was not useful to identify this condition in all cases. Cysts were simply removed. None of these patients reported recurrent abdominal pain after surgery (follow-up 3-6 months)

Ovarian cyst torsion: 3 (13%) cases, two cases in the right side and one case in the left side. Two cases were cystic teratoma while one case was hemorrhagic cyst. Ultrasound was useful to identify the cysts but not the nature or the torsion. All these cysts were $> 6 \text{ cm}$ in diameter. Cysts were removed. None of these patients reported abdominal pain after surgery (follow-up 6 months)

Ovarian/tubal complex torsion: 11 (46%) cases, 7 cases in the right side and 4 cases in the left side. In all cases detorsion was performed before surgical removal; Three patients were treated with detorsion and conservation while in 8 (72%) cases the ovarian/tubal complex was removed. Of these cases, two cases were cystic teratoma while one case was dermoid cyst. None of our patients had oophoropexy after detorsion.

One patient with ovarian detorsion and conservation was pre-operatively diagnosed as having Herlyn Werner Wunderlich syndrome: this 13 year old girl was transferred to our unit for acute abdomen from another Hospital were MRI findings reported a left renal agenesis, blind hemivagina distended by hematic fluid, complete uterus duplication, dilated tuba and left ovarian mass with torsion. A diagnostic laparoscopy was performed during which a mass of inflamed tissue covering the ovary was resected. Herlyn Werner Wunderlich syndrome represents a set of anatomical abnormalities characterized by unilateral renal agenesis, complete duplication of the uterus and ipsilateral blind hemivagina. It can present with abdominal pain due reflux of material to the uterus, tube and then ovary. This syndrome usually manifests itself some months from menarche and the abdominal pain could be accompanied by metrorragia and pelvic discomfort.

The mean symptoms duration prior to presentation was 7,1 days (7 ± 4.1 days) for patients with conservation of the ovarian/tubal complex after detorsion; the mean symptoms duration prior to presentation was 3 days for patients with complex resection. ($p > 0.05$)

Ultrasound diagnosed 7 cases (63%) of torsion and the presence of a dermoid cyst.

Patients with ovarian/tube complex detorsion were checked one and 3 months after surgery by ultrasound and in all cases the ovaries were smaller than contralateral with vascularisation and a multifollicular aspect.



Figure 2 Intra-operative view; isolated tubal torsion.

Isolated tubal torsion: (figure 2)3 (13%) cases, all were on the right side ($p < 0.05$). All Fallopian tubes were removed. One case was intraoperatively diagnosed as distal tube torsion (that was removed)(figure 3). Ultrasound was not useful to identify the nature of this condition. In all cases, ultrasound reported a higher volume with oedema of the tubal wall. None of these patients reported abdominal pain during control visits (3 and 6 months post-op)

Considering the time of symptoms, in the ovarian/tubal complex torsion symptoms occurred with a mean of $5,6 \pm 4,5$ days respect to isolated tubal torsion that was $2 \pm 1,4$ and other conditions that was 3 ± 2.3 days ($p > 0.05$).



Figure 3 Distal tube torsion: intraoperative findings.

Considering blood test, white cell count was high in 7 (54%) patients with ovarian or tubal torsion (7 of 14 patients)($p < 0.05$); there was no correlation between blood tests and other intra-operative findings. It was not possible to correlate symptoms with intra-operative findings. Pre-operative markers were not useful to manage these conditions.

Pre-operative ultrasound was useful to identify 7 cases (63%) of ovarian torsion and the case of dermoid cyst; isolated tubal torsion was never diagnosed before surgery, and none of cases of paraovarian cyst torsion were suspected.

4. DISCUSSION

Discussion

The differential diagnosis of acute abdominal pain is broad, especially in young female. [1]

Preoperatively more common causes such as appendicitis or diseases of gastrointestinal and urinary tract or gynaecological condition may be suspected. However the correct diagnosis is in the most cases not made until visual inspection of the pelvic organs during surgery. [2-3]

Early detection and adequate surgical management of gynaecological condition is necessary, to preserve fertility especially in cases with adnexal torsion.

Paraovarian/paratubal cysts, in a rare pathology in childhood. The incidence is not clearly defined, but has been reported to be 29 per 1000 cases. Stimulating hormonal factors have been postulated for these cysts development, but many cases are reported also in pre-menarchal young girls. [5]

Its complications such as hemorrhage, torsion and perforation seems to be more common in children than in adults. The clinical course of these cysts is usually silent and diagnosis is made, if complicated, only during surgery. It has been reported that paraovarian/tubal cysts represent approximately 10% of all adnexal masses in adults and children. In literature these cysts are more common in the third decade of life; the higher rate of complications in childhood has been attributed to the relatively long pelvic ligaments in this population. [6-7]

Diagnosis of these cysts has proven difficult; ultrasound seems to be the best imaging modality, but many studies reported that only 30-40% of cases are diagnosed pre-operatively. A recent study reported that although aspiration and leaving smaller paraovarian/tubal cysts is common practice (in cases without complications, i.e. incidental findings during other procedures), most studies suggest excision of larger cysts > 3 cm in order to avoid future complications. [8]

Although rare, Okada reported that paraovarian cysts containing neoplasm have been reported, and most of them were carcinoma (cystadenocarcinoma and papillary carcinoma). Most of neoplasm occurred in adults, but Genadry reported in 1977 a case of tumor in a 13-years old patient. [7]

Many authors performed also CT scans or MRI, but without advantage for diagnosis. [8-9]

Isolated Fallopian tube torsion is reported with an incidence of 1 in 1 500 000 women and is reported to be rare before menarche or during menopause but, it is also seen in the premenarchal population and in pregnancy. [10]

Intrinsic causes include congenital anomalies, acquired pathology (cysts, hydrosalpinx, inflammatory disease) and abnormal peristalsis. Extrinsic causes include local factors or mechanical factors. [10-12]

Isolated tubal torsion is reported to have a right-sided prevalence; this fact has been attributed to the cushioning effect of the sigmoid colon and the slightly longer right mesosalpinx and to the more frequent exploration of patients with right lower quadrant pain for presumed appendicitis. In some reports, isolated tubal torsion appeared more frequently during the premenstrual phase because of the congestion of the mesosalpingeal veins at the time. [13-14]

The most common symptom is ipsilateral lower abdominal pain, but it has been reported that often is associated with chronic pain, and may have associated nausea and vomiting; laboratory analysis are usually non-specific; it has been reported that the laterality of the pain corresponded to the side of torsion in all patients with pain localization. [15-18]

The ultrasound evaluation includes normal ovaries with a dilated tube with thickened, echogenic walls and internal debris, representing a torsed tube; other ultrasound findings are a long tubular convoluted cystic structure that tapers toward the uterine cornua, a thin-walled cystic structure with variable septations and mixed internal echoes with visualization of a normal ipsilateral ovary; color Doppler ultrasonography may demonstrate unilateral absence of blood flow, but this finding doesn't necessarily rule out tubal torsion. The value of CT scan and magnetic resonance imaging in diagnosing this condition had been controversial. [10]

The pediatric literature reported, in series or case reports, less than 60 cases [10-26]; most of these cases were considered secondary to underlying adnexal pathology. Menstrual history,

not reported if regular or irregular, was available for 70% of the cases. The youngest patients reported had 4 years old. Two studies reported chronic tubal torsion. Chronicity is thought to be an outcomes of alterative phases of mild spontaneous torsion and detorsion. [11]

Salpingectomy has been the standard treatment if a clear necrotic tube is found, nonreversible ischemia is seen, or there is evidence of secondary tube torsion. Detorsion of the tube, without resection, was first described by Kurzbart; this is typically performed in cases of recent onset or incomplete torsion when there is evidence of potentially viable tubal tissue. Promising results were reported following adnexal detorsion but the long term outcomes of this approach are unknown. Despite the theoretical risk of pulmonary embolism following detorsion and thrombosis of the tubal vascular supply, there is no evidence supporting this hypothesis. The incidence of pulmonary embolism following adnexal resection has been shown to be in fact the same as follows adnexal detorsion, estimated at 0,2%. [11-18]

Conservative treatment has been proposed also by Boukaidi et al [14], that reported their experience with 6 cases of isolated tubal torsion; their conclusion is to preserve the tube or at least to perform a distal salpingectomy. In their series, 3 patients had recurrence that underwent salpingectomy. However, literature has previously suggested that a scarred or damaged tube, hydrosalpinx or tubal pathology may result in lower fertility outcomes.

Ovarian torsion is a condition which required prompt surgical treatment; the most frequent cause of torsion is the presence of cysts or tumors. The most frequently observed malformations are cystic teratomas, follicular cysts, hemorrhagic cysts, cystoadenomas and hydrosalpinx. Ultrasound with Doppler is useful to identify torsion; the increased intraovarian pressure, due to exceeding arterial blood pressure increase edema and small cysts in the ovarian periphery could be observed. Traditional treatment was oophorectomy as it was believed that the ischemic-hemorrhagic ovary (black-bluish ovary) was nonviable and was therefore removed because of fear of peritonitis, embolism and malignancy. [27-29]

There are no reliable methods for the evaluation of the vitality of ovaries after ovarian torsion, and there are no criteria to determine whether the ovary should be removed or left in place. Some authors reported that the black-bluish color must not be considered as a sufficient indicator to distinguish between reversible ischemia and necrosis; Oelsner reported from their experience of 102 cases that in 93% of patients the function of the ovaries was retained. [30]

In the past decade the surgical treatment of ovarian torsion in children has become more conservative, but the scientific literature provides only a few studies in pediatric age [30-32]. The role of oophoropexy is controversial and not clear and many authors reported different methods; some authors suggest fixing the ovary to the side-wall of the pelvis or uterine serosa, and other suggest to plicate the ovarian ligaments.

In literature, there are few studies about the functioning of the preserved ovaries after detorsion in pediatric age. Long term results are different and some authors reported two cases in which the ovaries were undetectable at ultrasound months later; other cases had multifollicular ovaries. [30-31]

Geimanaite treated 31 cases and their long term results for 20 of these were: 19 patients had the ovaries with normal size with follicles and in one case the ovary was undetectable by ultrasound.

5. CONCLUSIONS

Conclusions

This study reported our experience with acute abdominal pain in young female aged 3-16 years old; the most important findings regard the incidence of paraovarian/tubal cysts and

isolated tubal torsion (one case of distal tube torsion); there are no long term results in literature about fertility potential of patients treated with conservative management for tubal and ovarian torsion but those working with infertility recommend salpingectomy for hydrosalpinx prior to in vitro fertilization. [30-31]

It is our opinion that this data should be considered and explained to parents during the pre-operative counselling for both conservation and resection technique.

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