

Role of Laparoscopy in the Management of Isolated Fallopian Tube Torsion in Adolescents

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Table of Contents

1. INTRODUCTION	1
2. MATERIALS AND METHODS	2
3. RESULTS	2
4. DISCUSSION	3
5. TABLE 1: the data of all patients	5

ABSTRACT

Background/Purpose Isolated Fallopian tube torsion (IFTT) is a rare cause of acute abdominal pain in female. The preoperative diagnosis is difficult because of a lack of specific clinical and radiological signs. Surgery is often performed when is no longer possible to preserve the integrity of the tube. We report our experience in the laparoscopic management of four teenagers with IFTT.

Methods Four patients (aged 12 to 15 years) came to our observation for worsening abdominal pain, nausea and vomit. On admission all girls had blood tests, ultrasound and Magnetic Resonance. Laparoscopy was performed in all cases for the diagnosis. All girls had US and clinic follow up.

Results Laparoscopic exploration allowed the diagnosis of IFTT with necrosis of the same in all cases. In two girls a laparoscopic salpingectomy was performed. In the other two cases an open salpingectomy was necessary because of pelvic adhesions. Histology showed a hemorrhagic infarction of the Fallopian tubes. At follow up all patients were asymptomatic with normal ovaries.

Conclusions In the differential diagnosis of acute abdominal pain in children or female adolescents the possibility of IFTT should always be considered, since an early diagnosis can lead to a conservative treatment. Laparoscopy allows to perform a definitive diagnosis and treatment.

1. INTRODUCTION

Introduction

Isolated Fallopian tube torsion (IFTT) is characterized by the rotation of the Fallopian tube around itself, without involving the ipsilateral ovary.

IFTT is a rare cause of abdominal pain. The incidence is 1 in 1.500.000 in adults [1] and is less frequent in children [2]. The first description in adults was in 1890 by Bland-Sutton [3], but the first pediatric case was reported by Hansen in 1922 [4]. Although the etiology is unknown, in the adults several predisposing factors have been identified: Youssef classified them in intrinsic factors such as hidrosalpinx, hematosalpinx, tubal neoplasm and abnormal tubal peristalsis, and extrinsic factors such as paraovarian or paratubal masses, post-operative adhesions, uterine enlargement due to pregnancy or tumor [5]. Sudden changes in body position and trauma have been described as predisposing factors as well [6]. In children the only predisposing factors are represented by congenital malformations, such as congenital Mullerian duct anomalies, long mesosalpinx, hydatid cyst of Morgagni [7]. Preoperative diagnosis is difficult, resulting in delay in the surgical treatment. Laparoscopy for these cases is considered the “gold standard”, since it allows an accurate diagnosis and surgical treatment.

We report our experience in the management of IFTT.

2. MATERIALS AND METHODS

Material and methods

From January 2005 to September 2013 we treated four patients (age: 12 to 15 years) with IFTT. For all patients, treated at Pediatric Surgery Unit, we retrospectively evaluated clinical presentation, preoperative diagnosis, laparoscopy, surgical treatment, histology and follow-up.

Laparoscopic technique: a 10-mm umbilical trocar was placed using an open technique. The pneumoperitoneum was obtained by CO₂ insufflation up to 12 mmHg. Two 5-mm trocars were positioned in the right and left iliac quadrant. Salpingectomy was performed using Ultracision Harmonic Scalpel®.

All patients were monitored with clinical and US study performed 2 and 4 weeks after discharge.

3. RESULTS

Results

All patients came to our observation because of acute abdominal pain. Nausea was present in three cases and vomit in two. The pain was localized in the left lower quadrant in three girls, in the right in one. Menarche was present only in two patients (aged 14 and 15 years). Three out of four patients practiced artistic gymnastics (See below Table 1).

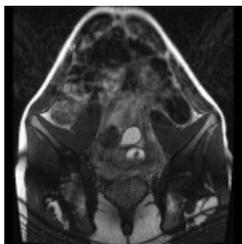


Figure 1: MR imaging: winding tubular structure.

All girls had a complete blood count (mild leukocytosis in one case and CRP elevated in two). US examination showed a presence of a roundish pelvic mass in two cases and tubular in the others; a normal ovarian vascularization and structure were seen in all cases. For the suspicion

of adnexal disease all patients underwent a Magnetic Resonance (MR) which confirmed a normal ovaries with a dilated pelvic spiral structure (Figure 1) in each case.

All girls underwent a laparoscopy that showed a IFTT. The treatment for the first two cases was an open salpingectomy (Pfannenstiel laparotomy): in a patient the left tube was tenaciously coated to ipsilateral intact ovary and in the other the right twisted tube was too close to the uterine wall (absence of a clear cleavage plane). In the other two cases a left laparoscopic salpingectomy was necessary because of the poor tubal vascularization after detorsion (Figure 2).



Figure 2 Laparoscopy: left IFTT with necrosis of the tube and normal ipsilateral ovary.

Hemorrhage and necrosis of the tube were found in all cases at histopathologic study.

At follow up all girls were asymptomatic and US examination showed normal ovaries in both sides.

4. DISCUSSION

Discussion

IFTT is a rare cause of lower abdominal or pelvic pain in girls. Differential diagnosis in the pediatric and adolescent population includes acute appendicitis, pelvic inflammatory disease, twisted ovarian cyst, ruptured follicular cyst, urinary tract disease and renal colic.

This condition is extremely rare before menarche: only a few cases were reported in this age [8-11]. The right side seems to be more frequently affected (about 60%), but in our series 3 patients of 4 had a left IFTT according to Boukaidi [12].

Preoperative diagnosis can be difficult because a lack of specific signs. The most common presenting symptom, as in our series, is the pain located in the lower abdomen. Laboratory tests show no specific frameworks: leukocytosis, usually mild, with increased inflammation indexes. Ultrasound can be useful in the preoperative evaluation, but in most cases it is not definitive for diagnosis. The role of CT scan or MR is still controversial. In our series the immediate availability of MR allowed all patients to have such examination permitting a preoperative diagnosis in two.

Although in a minority of cases the diagnosis may be suspected preoperatively, IFTT is ultimately diagnosed during surgery.

Laparoscopy for IFTT in a child was first described by Maynard in 1996 (13). To date it can be undoubtedly considered the method of choice for the definitive diagnosis and treatment, furthermore *it is possible to perform an accurate inspection of abdominal cavity and pelvis to rule out additional pathology.*

The surgical treatment of IFTT can be tubal detorsion or salpingectomy. Tubal detorsion can be attempted only if ischemic damage appears to be reversible but clear criteria for detorsion

without resection remain vague in Literature. In cases of late diagnosis salpingectomy is necessary because of the irreversible vascular changes of the tube. Partial salpingectomy is a debated therapeutic option but some Authors reported that the residual part of the tube may be the site of hydrosalpinx or ectopic pregnancy [14].

Furthermore laparoscopy reduces the risk of abdominal adhesions, which is especially important for girl of reproductive age who wish to preserve their fertility.

During surgery, we have used Ultracision Harmonic Scalpel®, that is the unique mechanism of action allowing cut and coagulation without causing a significant rise in temperature at the tissue level; it has largely used to perform common gynecologic surgical procedures: total and subtotal hysterectomy, myomectomy and excision of endometriosis [15]. This device has allowed a short operating time with a safe, effective and easy procedure.

A possible point of discussion is the sports activity practiced by girls in our series. Interestingly, we observed that 3 patients practiced a sport as artistic gymnastic that involves sudden changes in body position.

In conclusion ,we emphasize the importance of an early laparoscopic approach in order to have a prompt diagnosis and treatment of IFTT with a major impact on the future life and fertility of young girls.

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5. TABLE 1: the data of all patients

Table 1: table summarizing the data of all patients.

	V.S.12 aa	C.N.13 aa	A.M.14 aa	R.D.15 aa
Symptoms	Abdominal pain	Abdominal pain, nausea	Abdominal pain, nausea, vomit	Abdominal pain, nausea, vomit
Side	Left	Right	Left	Left
Menarche	No	No	Yes	Yes
Laboratory exam	↑Fibrinogen (540 mg/dl)	↑ WC 12.000	↑ WC 15.000 ↑ CRP 4,8	↑ WC 13.500 ↑ CRP 7,1
Ultrasound	Yes	Yes	Yes	Yes
MR	Yes	Yes	Yes	Yes
Laparoscopy exploration	Yes	Yes	Yes	Yes
Treatment	Laparoscopic exploration, Open Salpingectomy	Laparoscopic Exploration, Open Salpingectomy	Laparoscopic Salpingectomy	Laparoscopic Salpingectomy
Follow-up (2-4 weeks after surgery)	Fine	Fine	Fine	Fine