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Contribution of imaging in the diagnosis of ovarian torsion in young women during the period of genital activity: about 26 cases

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Abstract

The objectives of the study were to describe the epidemiological profile of ovarian torsion, study the clinical particularities, underline the different radiological signs and correlate them with operative findings, and finally to compare the results of our series with literature. Our work is a retrospective study of 26 cases of ovarian torsion, collected at the mother-child radiology and gyneco-obstetrics department of the CHU HASSAN II of FEZ, during a period of 5 years (JUNE 2015-JUNE 2020). Ultrasound established the diagnosis in 15 cases (57%). 7 patients benefited from additional CT and 4 patients from MRI due to doubt about ultrasound data. These imaging techniques have made it possible to better identify the signs of ovarian torsion, in particular the Tourbillon or whirlpool sign, as well as the good characterization of the underlying lesions generally responsible for the ovarian torsion. Conservative treatment was performed in 64% of cases. A pathological ovary was found in 92% of cases, with a predominance of serous cystadenomas. Imaging permit rapid diagnosis and early surgery, allowing the preservationof the patient fertility.

Keywords:*Torsion, Ovary, Emergency.*

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I. Introduction

Ovarian torsion (OT) is a rare etiology of acute pelvic pain that can be seen at any age, from the fetal period to adulthood [1, 2], most commonly in women of childbearing age. Its prevalence is 2.5 to 7.4% of all gynecological emergencies. [3]

It results from the spontaneous partial or complete rotation of the vascular and lymphatic pedicle of the adnexa around its axis, defined by the lumbo-ovarian ligament and the utero-ovarian ligament, causing a disturbance first of the venous circulation, then of the arterial circulation,leading to congestion, edema, ischemia of the adnexa, and finally, to its necrosis [4].

It is a surgical emergency whose diagnosis remains a challenge, it must be fast in order to preserve the fertility of young patients as well as their vital prognosis which is rarely at stake.

Imaging plays a crucial role in diagnosis as well as in the search for underlying pathology. Abdominal-pelvic ultrasound combined with Doppler is a non-invasive and accessible technique, necessary in emergencies for the diagnosis of ovarian torsion because of its ability to directly and rapidly assess ovarian morphology and vascularization [5]. CT and MRI are useful when ultrasound is inconclusive.

Laparoscopy with conservative treatment is the method of choice to preserve the ovarian tissue as much as possible [6].

II. Methods

Retrospective study, extended over 5 years from June 2015 to June 2020 on a series of 26 cases of ovarian torsion; diagnosed and treated at the Mother-Child Radiology and Gynecology-Obstetrics departments of the CHU Hassan II of Fez. The aim was to review our experience on ovarian torsion in young women, discuss the epidemiological profile, diagnostic difficulties, radiological signs related to ovarian torsion, best therapeutic management, and to compare the results of our series with literature.

All patients of childbearing age with ovarian torsion, diagnosed clinically and radiologically, and confirmed surgically, were included in the above period.

III. Results

The mean age was 28 years with extremes ranging from 16 to 42 years. The emergency consultation time varies from 4 hours to 7 days with an average of 2 days, a standard deviation of 2.37, and a peak of 24 hours. 20 patients (77%) presented with acute pain, and 6 patients (23%) had subacute pain. Pelvic pain is generally unilateral, with 13 cases in the right iliac fossa (RIF) (51%) and 9 cases in the left iliac fossa (LIF) (34%).

All patients benefited from an initial biological assessment made of a complete blood count (CBC), and a βHCG. Positive βHCG in 3 patients related to torsion on pregnancy.

Ultrasound was performed systematically in all our patients. The direct signs were negative flow in 10 cases (38.5%), poor vascularization in 2 cases (7.5%), peripheral vascularization in 14 cases (54%), Whirlpool sign (= Tourbillon sign) was seen in only one patient. Indirect signs were the presence of an ovarian mass on ultrasound in 25 patients (96%), their size varied between 4 and 17 cm with an average of 9.76 cm. The presence of a swollen appearance of the ovary in all patients (100%). The presence of microcysts in the periphery of the ovary in 3 patients (12%). And the presence of an effusion in 11 patients (55%).

The CT scan was performed in 7 patients (28%) when there was doubt on the ultrasound data. It showed the presence of direct signs represented by the turns of spires in all the patients (100%) [figure 1]. And abnormal or absent enhancement in 5 patients (71.42%). Indirect signs represented by ovarian masses (varying between 4cm and 12cm) with an average value of 8.91 cm, a swollen appearance of the ovary in all patients, peripheral disposition of the follicles in 2 patients, and effusion in 5 patients (71.42%) [figure 2 and 3].

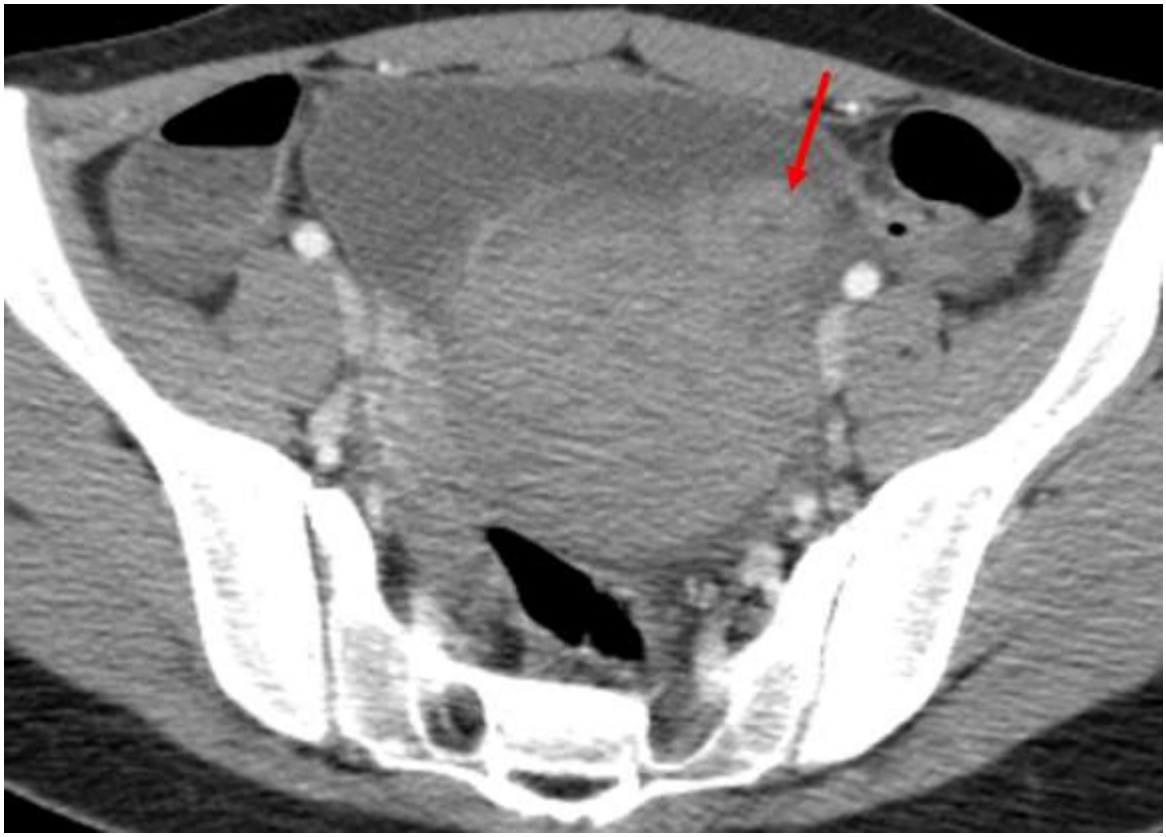

Figure 1: Pelvic CT injected in axial section showing a turn of the spire (red arrow).

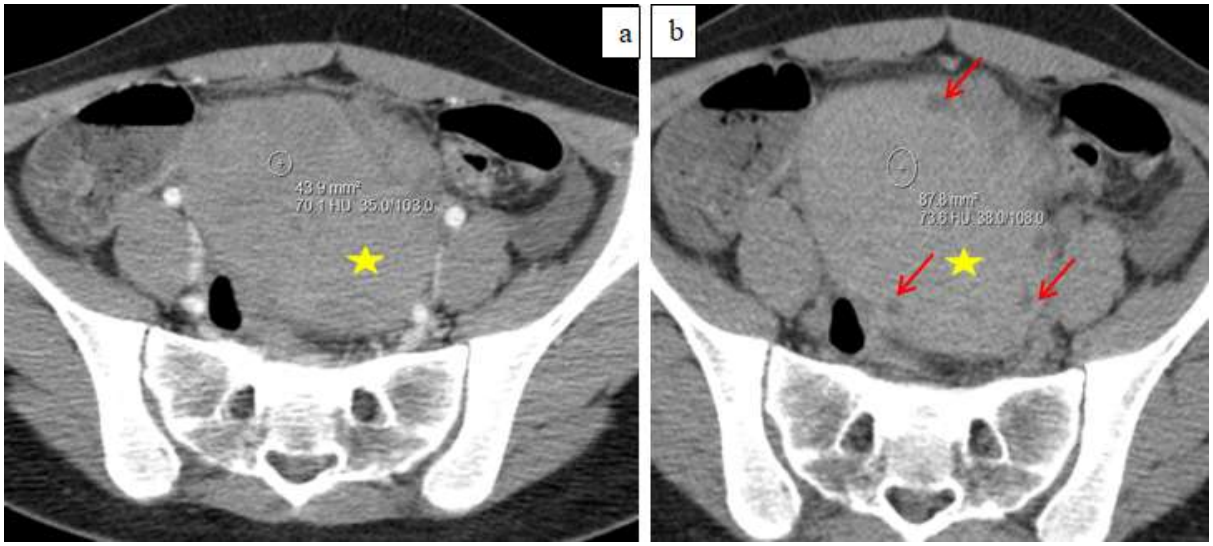

Figure 2: Pelvic c- (a) and injected (b) CT in axial section showing the edema of the ovarian parenchyma of high density (star), the peripheral arrangement of the ovarian follicles (arrow), and the absence of enhancement after injection.

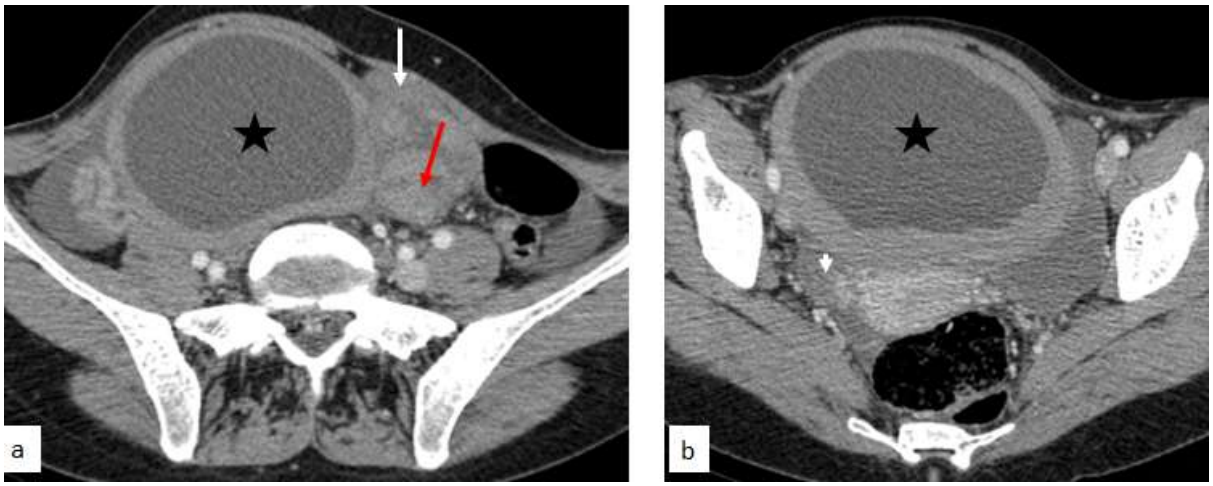

Figure 3 : Injected pelvic CT scan (a,b) in axial section showing an enlarged left ovary, measuring 15 x 10 cm, with a cystic lesion (star), measuring 11 x 7 cm, turgidity of the left ovarian pedicles (white arrow), with individualization of a turn of spire (red arrow). Normal right ovary (arrowhead).

Four patients (a pregnant woman and 3 young girls) benefited from magnetic resonance imaging (MRI) (16%). The direct signs represented by the turn of the spire in one patient, the absence of enhancement in two patients with haemorrhagic remodeling. Indirect signs was represented by the constant increase in the size of the ovary, varying from 6.8 to 23cm with an average of 11.2cm, the presence of peripherally arranged follicles, edema of the ovarian stroma in two patients, and effusion of variable abundance in all patients. [Figures 4.5 and 6].

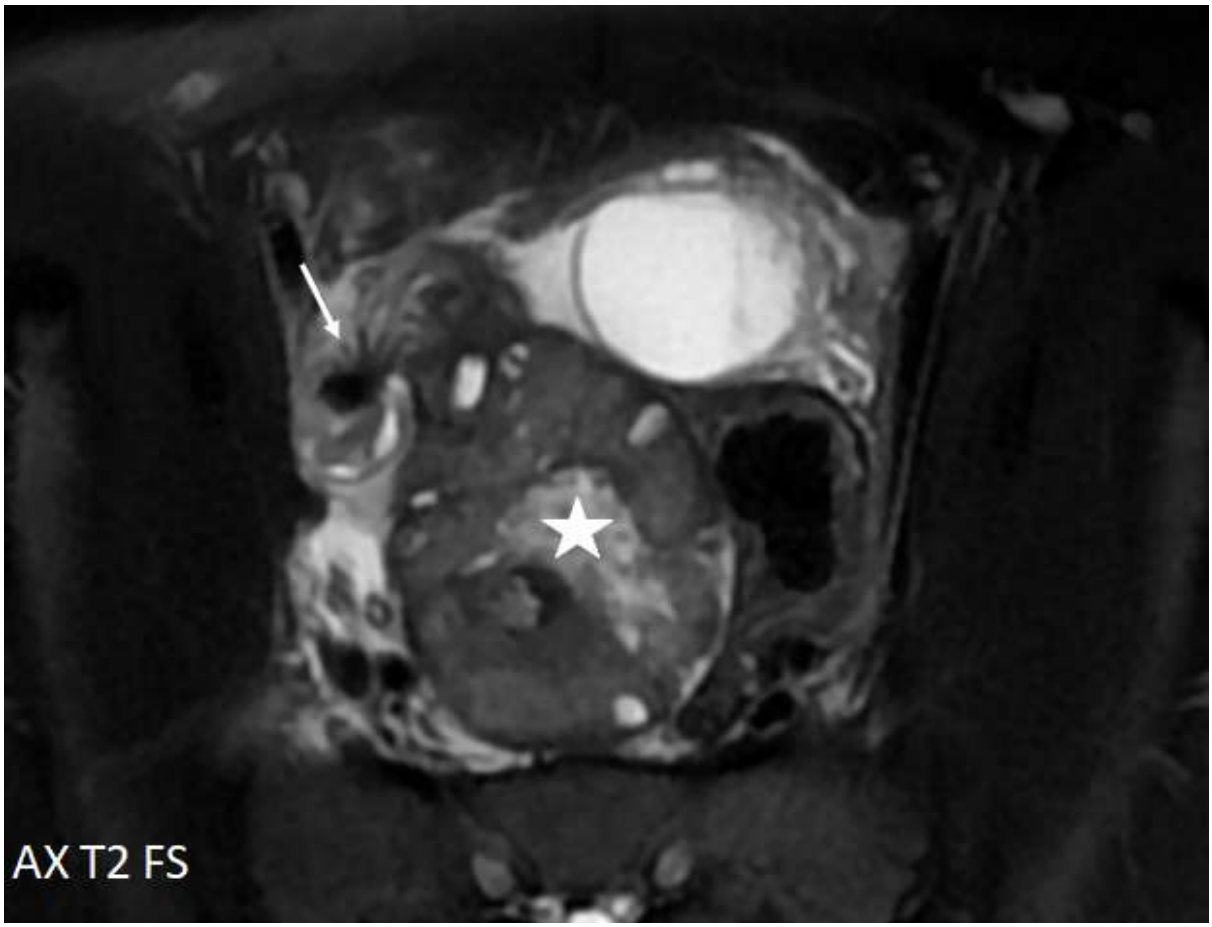

Figure 4: Pelvic MRI showing a wirhpool sign (arrow), enlarged right ovary, ovarian stromal edema (star) and peripheral arrangement of follicles.

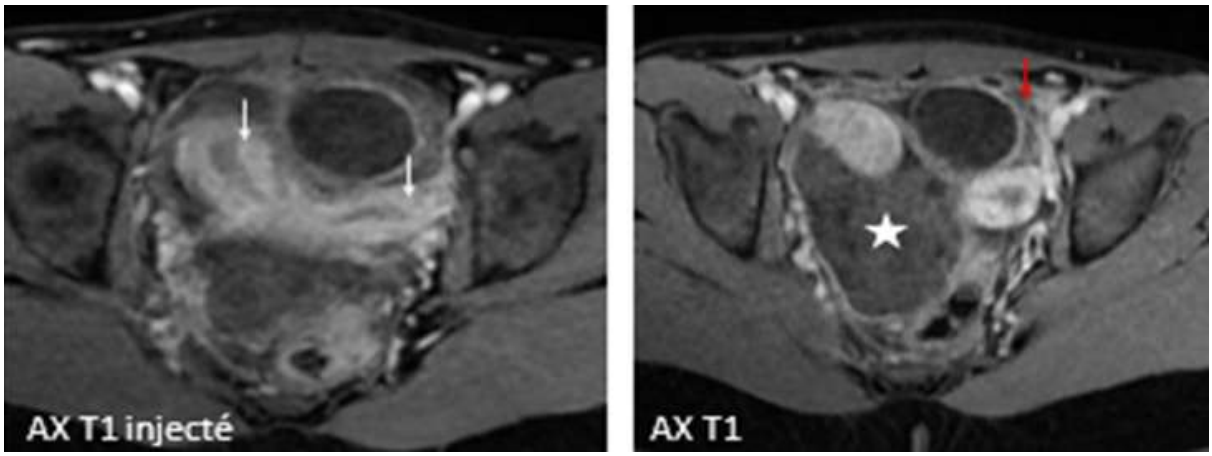

Figure 5: Pelvic MRI showing a bicornuate uterus (white arrow), normal enhancement of the left ovary which is the seat of a cystic lesion (red arrow), and the absence of enhancement of the twisted right ovary (star).

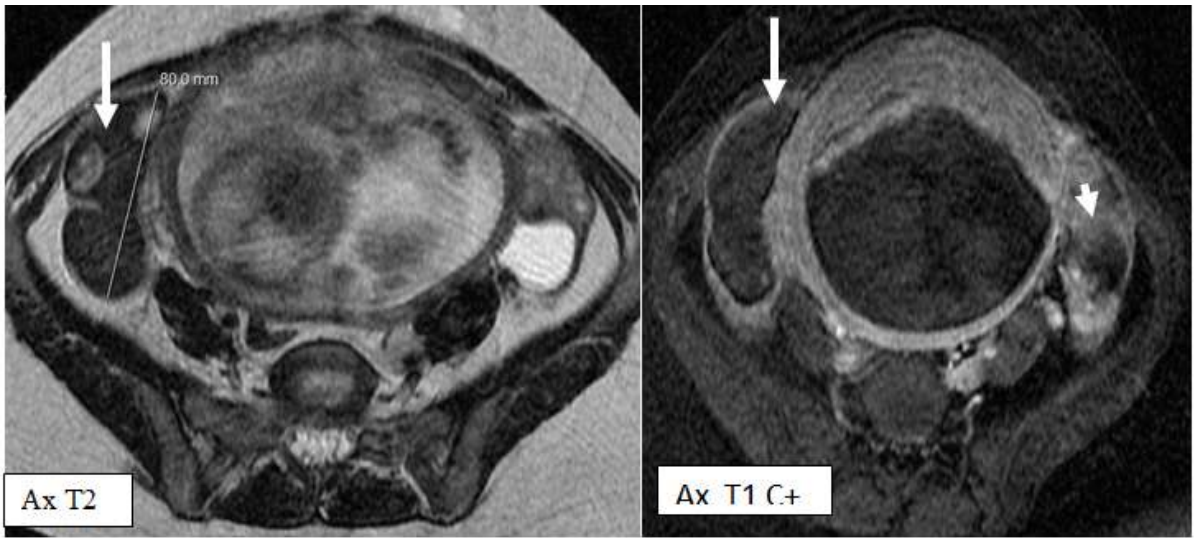

Figure 6 : Pelvic MRI of a 23 WA pregnant woman showing an enlarged right ovary, not enhanced after contrast, measuring 8 x 4 cm, unlike the left ovary which is normally enhanced (arrowhead).

Surgery confirmed ovarian torsion, with torsion on pathological ovary in 25 cases. A viable appearance of the ovary in 8 cases. The degree of torsion was ranged from 1 to 6 turns of spire (TOS), with an average of 2.4 TOS, a standard deviation of 1.5 and a peak frequency of 2 TOS. The majority of patients with subacute symptomatology had a degree of torsion that varied between 1 and 2 turns of spire. Conservative treatment by detorsion followed by cystectomy was performed in 16 patients. Radical treatment by adnexectomy was performed in ten patients after detorsion without revascularization for 20 to 30 min [figure 7].

The anatomo-pathological findings for 22 patients were serous cystadenoma in 7 cases (30.4%), dermoid cyst in 5 cases (21.7%), hemorrhagic cyst in 3 cases (13%), and remodeled cyst in seven 7 cases (30.4%).

Figure 7 : Intraoperative view of a necrotic and swollen ovary containing a 4 cm cyst with 3 spiral turns.

IV. Discussion

Ovarian torsion can occur at any age, but most often in young women, including during pregnancy. It is the fifth most common gynecological emergency with an estimated prevalence of about 2.7% to 3% of all young women with acute abdominal pain [7].

Imaging makes it possible to establish the diagnosis, and to eliminate other differential diagnoses. A suprapubic +/- endovaginal ultrasound with Doppler completed at the slightest doubt by an abdomino-pelvic CT scan or a pelvic MRI can avoid a delay in diagnosis and surgical management[8].

The usual predisposing risk factor is an ipsilateral ovarian mass 5 cm or more in diameter. Common masses include follicular cysts, luteal cysts, mature cystic teratomas, and cystadenomas[9].

The proportion of ovarian torsion in the pediatric population on normal ovaries is high, 15 to 50% of cases [10]. This is generally due to malformations of the utero-ovarian ligament and its excessive length. The ovarian torsion-pregnancy association is evaluated from 8% to 28.7% (11% in our series). It occurs mainly during the first trimester, and the most frequent etiology is the presence of a corpus luteum cyst [8]. Ovarian stimulation in cases of infertility is recognized as a contributing factor, due to the increase in volume and weight of the ovary [11].

The long delay in consultation, due to atypical clinical symptoms, especially intermittent pain, probably resulting from torsion/detorsion found in 4% to 28% of cases [12]. The disappearance of the pain may reflect either a spontaneously resolving episode of subtortion episode or infarction of the twisted adnexa.

Ultrasound is performed as first-line procedure for any sudden onset of pelvic pain. It makes it possible to diagnose ovarian torsion and to eliminate other pathologies such as extra uterine pregnancy, appendicitis, upper genital infections, and hemorrhagic and/or ruptured cyst.

The transvaginal sonography has better sensitivity and specificity than suprapubic exam used in pregnant or virgin patients. In our study, the diagnosis of ovarian torsion by ultrasound was 59%. This agrees with the literature, with an ultrasound sensitivity that varies from 40 to 75%[7].

Ultrasound signs depend on the degree of torsion and the delay in performing the imaging. The main signs are:

- The presence of an ovarian mass or a cyst with a size exceeding 5cm.
- An increase in the size of the ovary hyper or hypo echogenic.
- Ovarian edema with a peripheral distribution of the follicles of 8 to 12 mm realizing the so-called pearl necklace appearance.
- A peritoneal effusion.
- Abnormal localization of the ovary, and deviation of the uterus to the side of the torsion.

The Doppler signs are:

- The "Whirlpool Sign" of a twisted vascular pedicle
- Decreased or stopped venous flow (common)
- An absent arterial Doppler (less common)

The most specific sign of OT on ultrasound is the visualization of the torsional spiral of the vascular pedicle (lumbo-ovarian and/or utero-ovarian). In our series, the low sensitivity of this sign may be explained by the operator's lack of experience, the impossibility of performing endovaginal ultrasound in virgin patients, obesity, or the gas screen hindering the exploration.

The maintenance of blood flow does not exclude the diagnosis, this sign has a low negative predictive value since the total absence of flow is only visible in the late phase. It is a good prognostic tool. And the possible explanations are:

1) - The presence of a double arterial network supplying the ovary.
2) - Intermittent torsion.
3) - Partial torsion that compromises venous flow with little or no effect on arterial flow.

Complementary CT scan to ultrasound was performed for 7 patients, for the same reasons reported in the literature. 2 patients presented an atypical clinical symptoms made of cyclic pains which evolved for more than 6 days. The other patients had doubts about the nature of the underlying mass, and/or to specify the relationship with the surrounding organs.

Radiological signs are the same as those described on ultrasound and MRI. The presence of a turn of the spire was objectified in all the patients. And we better visualize the hemorrhagic remodeling within the swollen ovary, the infiltration of the peradnexal fat, and the heterogeneous enhancement or the absence of enhancement which are signs of the transition from the ischemic phase to infarction. CT better detects the fatty and calcific component of a teratoma.

Pelvic MRI allows the etiological diagnosis of OT, by characterizing ovarian masses using morphological and dynamic sequences. The T2 and T1 injected sequences better show the hypertrophied aspect of the ovary with edema of the afollicular stromal center in T2 hypersignal and follicles in T2 hypersignal displaced in the periphery secondary to the edema. Intra-ovarian necrotic-haemorrhagic remodeling present as T2 hyposignal and T1 hypersignal, which persists after fat saturation.

Ovarian torsion occurs most often on the right side [14]. This may be explained by the physiologically longer aspect of the right utero-ovarian ligament, and/or the presence of the sigmoid colon, which reduces the space available for torsion to occur unlike the hypermobility of the cecum and ileum on the right [15].

Conservative treatment by laparoscopy is the treatment of choice. Laparotomy is performed immediately if imaging shows a large mass, usually larger than 10 cm, and/or if the mass shows signs of malignancy. Radical treatment is performed in postmenopausal women and ifmalignancy is suspected.

Limits of the study: retrospective study, almost all ultrasounds are performed by gynecologists, and radiologists are contacted in doubtful cases.

V. Conclusion

OT is a real diagnostic and therapeutic emergency. It is generally encountered in young women of childbearing age but can also occur in childhood and post-menopause.

Abdomino-pelvic ultrasound associated with color Doppler remains the essential examination in emergencies to explore abdomino-pelvic pain, it allows to establish the diagnosis in the majority of cases.

If ultrasound is inconclusive, a CT or MRI scan is essential to better characterize the different signs related to OT, and indicate a rapid surgical exploration in order to preserve the functional prognosis. Conservative treatment by detorsion is recommended.

What we already know about this topic

- Ovarian torsion is a surgical emergency
- Imaging allows positive and etiological diagnosis
- The reference treatment is conservative treatment.

What this study adds

- The consultation time is inversely proportional to the number of turn of the coil
- It confirms that the whirlpool sign is the most sensitive and specific direct sign

Conflicts of interest

The authors declare no conflict of interest

Contribution of the authors

All authors contributed to this work

References _

[1]. Balu M, Tarrant A, Lenoir M, Ducou Le Pointe H. Imagerie des masses ovariennes avant la puberté. Arch Pédiatrie. 2008;15(5):783-785.

[2]. Veyrac C, Perez R, Baud C, Couture A, Saguintaah M. Les douleurs pelviennes de la petite fille et de l´adolescente : l´imagerie diagnostique dans la pratique quotidienne. Feuillets de Radiologie. 2002;42(6):463-472.

[3]. Huchon C, Fauconnier A. Adnexal torsion: a literature review. Eur J Obstet Gynecol Reprod Biol 2010;150(1):8-12.

[4]. Sintim-Damoa A, Majmudar AS, Cohen HL, Parvey LS. Pediatric ovarian torsion : spectrum of imaging findings. RadioGraphics. 2017;37(6):18921908.

[5]. Guillaume Ssi-Yan-Kai, Anne-Laure Rivain, Caroline Trichot, Marie-Chantal Morcelet, Sophie Prevot, Xavier Deffieux, Jocelyne De Laveaucoupet. What every radiologist should know about adnexal torsion. 2018 Feb;25(1):51-59.

[6]. Rody A, Jackisch C, Klockenbusch W, Heinig J, Coenen-Worch V, Schneider HPG. The conservative management of adnexal torsion - a case report and review of the literature. Eur J Obstet Gynecol Reprod Biol. 2002;101(1):83-86.

[7]. Mashiach R, Melamed N, Gilad N, Ben-Shitrit G, Meizner I. Sonographic diagnosis of ovarian torsion accuracy and predictive factors. J Ultrasound Med 2011;30:1205-10

[8]. Defasque E., 2011. La torsion d'annexe : étude radio-clinique rétrospective à propos de 19 patientes. Thèse pour diplôme d'état de Docteur en médecine. À la faculté de médecine HENRI WAREMBOURG,. 43 p.

[9]. Oltmann S.Fischer A.Barber R.Huang R.Hicks B.Garcia N. Impossible d'exclure la torsion: un examen de 15 ans.J Pediatr Surg. 2009; 44 : 1212-1217

[10]. Rousseau V, Massicot R, Darwish AA, Sauvat F, Emond S, Thibaud E, et al. Emergency management and conservative surgery of ovarian torsion in children: a report of 40 cases. J Pediatr Adolesc Gynecol 2008;21:201e6

[11]. Mahonski S, Hu KM. Urgences génito-urinaires non obstétricales féminines. Emerg Med Clin North Am. 2019 Nov; 37 (4): 771-784.

[12]. Ochsner TJ, Roos JA, Johnson AS, Henderson JL. Ovarian torsion in a 13-year-old girl. J Emerg Med 2010; 38: e27-e30

[13]. Kives, S., Gascon, S., Dubuc, É., & Van Eyk, N. (2017). N° 341-Diagnostic et prise en charge de la torsion annexielle chez les filles, les adolescentes et les femmes adultes. Journal of Obstetrics and Gynaecology Canada, 39(2), 91–100. doi:10.1016/j.jogc.2016.12.009

[14]. Ekin M, Ya§ar L, Özdemir IA, Idil S. The management of adnexal torsion: ovaries can be saved by early diagnostic laparoscopy and detorsion. Bakırköy Tıp Der 2011;7:125-9

[15]. Feng, J.-L., Zheng, J., Lei, T., Xu, Y.-J., Pang, H., et Xie, H.-N. (2020). Comparaison de la torsion ovarienne entre les femmes enceintes et non enceintes en âge de procréer: résultats échographiques et pathologiques. Imagerie quantitative en médecine et chirurgie, 10 (1), 137–147. doi: 10.21037 / qims.2019.11.06