

# Epidemio-Clinical Aspects and MRI of Pelvic Endometriosis in Abidjan

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## Abstract

**Background:** The objectives is to determine the epidemiological characteristics and to describe the MRI characteristics of endometriotic lesions. **Subjects and Methods:** This was a retrospective and descriptive study which took place in Abidjan over a period of 15 months from March 2018 to May 2019. The examinations were carried out on a high field MRI 1.5 T with the following sequences: 3 T2 plans, axial diffusion with ADC cartography, T1 FAT saturation without and with axial injection. All the data were collected from MRI reports of the patients. A total of 68 patients were selected. Epidemiological parameters (age, reason for consultation); MRI parameters (lesional semiology and location of endometriotic lesions and type of endometriosis (internal: adenomyosis and external); associated lesions) were studied. The chi-square test was used to check the relationship between some factors, the differences were considered significant whenever  $p < 0.05$ . **Results:** The mean age of the patients was 38.61 years with ranges of 14 and 55 years. Suspicion of endometriosis was the predominant indication in 42.65% of cases. The adenomyosis was the most frequent location with 67.65% followed by ovarian involvement (35.29%). In patients with adenomyosis, the junction area was less than 20 mm in 44.19% of them. Ovarian endometriosis was objectified in 24 patients, which is a prevalence of 35.29%. Subperitoneal endometriosis was objectified in 19.12% of cases. Among them, we noted a predominance of the involvement of the uterosacral ligaments (16.18%) followed by the involvement of the torus with 13.24% of cases. Tubal involvement was 10.29%. The association of endometriosis and fibroma was observed in 44.12% of patients. The risk of adenomyosis was high after 40 years  $p < 0.005$ , ovarian localization significantly decreased with age. It was 0.07 between 30 and 40 years old and 0.03 after 40 years. **Conclusion:** MRI appears to be the reference imaging examination in the diagnosis and assessment of extension of pelvic endometriosis, because it offers the possibility of performing in one step a complete assessment of the compartments of the pelvis before laparoscopy. In sub-Saharan Africa and particularly in Ivory Coast, the diagnosis of endometriosis is made at an advanced age dominated by adenomyosis followed by endometriomas.

**Keywords:** MRI, Pelvic Endometriosis.

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## Introduction

Endometriosis is defined by the presence outside of the uterine cavity of tissues having the morphological and functional characteristics of the endometrium.<sup>[1]</sup> We are going to distinguish two types of pelvic endometriosis: adenomyosis and deep endometriosis. Endometriosis is the most common cause of chronic pelvic pain in women.<sup>[2]</sup> It is the third leading cause of gynecological hospitalization in the United States.<sup>[3]</sup> The prevalence of endometriosis in the female population will be from 5 to 10%.<sup>[4,5]</sup> It is 40 to 60% in women with dysmenorrhea and concerns 50% of infertile women.<sup>[5]</sup> However, it remains little known by the general public. The first-line imaging is pelvic ultrasonography, but its normality does not exclude the diagnosis. It may be supplemented by a second-line Magnetic Resonance Imaging (MRI) to support the diagnosis.<sup>[6]</sup> Endometriosis is a poorly known pathology and under explored in Africa particularly in Ivory Coast. So, we decided to carry out the present study which objective was to determine the epidemiological characteristics and to describe the MRI

characteristics of endometriotic lesions in our context.

## Subjects and Methods

This was a retrospective and descriptive study which took place in Abidjan over a period of 15 months from March 2018 to May 2019. The examinations were carried out on a high field 1.5 T MRI with the following sequences: 3 T2 plans; axial Diffusion b 0 and b 1500 with ADC cartography), T1 FAT saturation without and with axial injection. The files retained are those of patients who performed an MRI of the pelvis for suspected endometriosis during the period. Patients who had an MRI of the pelvis for other gynecological conditions (fibroids, cervical or endometrial tumor) and / or had extra pelvic endometriosis were not selected. All the data were collected from MRI reports of the patients. A total of 68 patients were selected. The parameters studied were epidemioclinical (age, reason for consultation), MRI (semiology and location of endometriotic lesions and type of endometriosis (internal:

adenomyosis and external); associated lesions).

We used the chi-square test to check for the relationship between some factors, the differences were considered significant whenever p was <0.05.

## Results

The mean age of the patients was 38.61 +/- 8.05 with extremes of 14 and 55 years and a predominance of the age group of 30-40 years which is 40.74%. Suspicion of endometriosis was the predominant indication in 42.65% of cases [Table 1]. Adenomyosis was the most frequent location of endometriosis with 67.65% of cases followed by ovarian involvement (35.29%) [Table 2]. The junctional area was less than 20 mm in patients with adenomyosis in 44.19% [Figure 1]. Subperitoneal endometriosis was 19.12% of cases. Among them, there was a predominance of involvement of the uterosacral ligaments (16.18%), followed by involvement of the torus in 13.24% of cases [Table 3]. We recorded tubal involvement in 10.29% of cases. The association of endometriosis and fibroma was observed in 44.12% of patients. The risk of adenomyosis was high after 40 years p <0.005 [Table 4], ovarian localization significantly decreased with age. It was 0.07 between 30 and 40 years and 0.03 after 40 years [Table 5].

**Table 1: Distribution of patients according to the indication for pelvic MRI.**

Indications	Patients	Percentage (%)
Lucky find	18	26,47
Suspicion of endometriosis	29	42,65
Myoma	14	20,59
Pelvic pain	13	19,12
Pelvic mass	8	11,76
Metrorrhagia	6	8,82
Ovarian Cyst	4	5,88
Dysmenorrhea	3	4,41

Suspicion of endometriosis was the indication for pelvic MRI in 42.65% of patients.

**Table 2: Global distribution of endometriotic lesions**

Location	Effective	Percentage (%)
Uterus (adenomyosis)	46	67,65
Ovary	24	35,29
Uterosacral ligament	11	16,18
Torus	9	13,24
Trumpets	7	10,29
Digestive	5	7,35
Douglas Symphysis	4	5,88
Vaginal cul-de-sac	3	4,41
Rectovaginal septum	3	4,41
Parameter sheathing the uterine artery	2	2,94
Sacro-recto-genito-pelvic blade	2	2,94
Ischial notch	1	1,47
Bladder	1	1,47
Abdominal wall	1	1,47

Adenomyosis was the most frequent location of endometriosis with 67.65% of patients followed by ovarian involvement (35.29%).

**Table 3: Répartition des patientes selon les localisations sous péritonéales de l'endométriose**

Location	Effective	Percentage (%)
Uterosacral ligament	11	16,18
Torus	9	13,24
Vaginal cul-de-sac	3	4,41
Rectovaginal septum	3	4,41
Sigmoid	5	7,35
Rectum	5	7,35
Douglas Symphysis	4	5,88

We noted a predominance of the involvement of the uterosacral ligaments (11 patients (16.18%)) followed by the involvement of the torus with 9 patients or 13.24%.

**Table 4: Age distribution according to the presence of adenomyosis**

Age	Adénomyosis			
	n (%)	Valeur p	OR	IC 95%
<=30 ans	2/9 (22,22%)	-	1 (reference)	
] 30-40 ans]	14/22 (63,64%)	0,048	6,13	1,02-36,89
>40 ans	19/23 (82,61%)	0,004	16,62	2,47-111,80

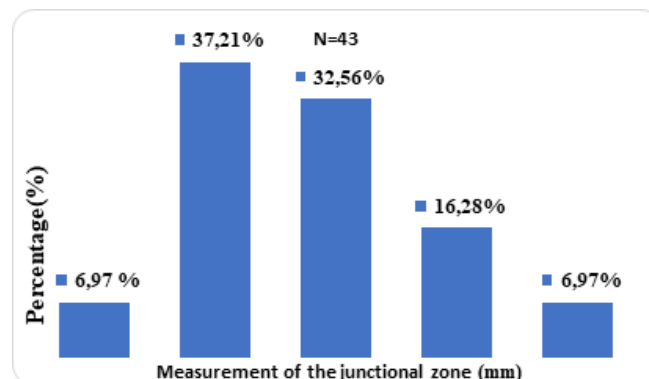
The risk of adenomyosis significantly increased with age. It was 6.13 times higher between 30 and 40 years old and 16.62 times higher after 40 years.

The junctional zone had a median of 23 mm and an interquartile range ranging from 14 to 37 mm. The junctional area was less than 20 mm in 44.19% of them.

**Table 5: Age distribution according to the presence of ovarian endometriosis**

Age	Ovarian endometriosis			
	n (%)	Valeur p	OR	IC 95%
<=30 ans	8/9 (88,89%)	-	1 (reference)	
] 30-40 ans]	8/22 (36,36%)	0,022	0,07	0,01-0,68
>40 ans	5/23 (21,74%)	0,004	0,03	0,00-0,35

The risk of ovarian endometriosis decreased significantly with age. It was 0.07 between 30 and 40 years old and 0.03 after 40 years.



**Figure 1: Measurement of the junction area in patients with adenomyosis**

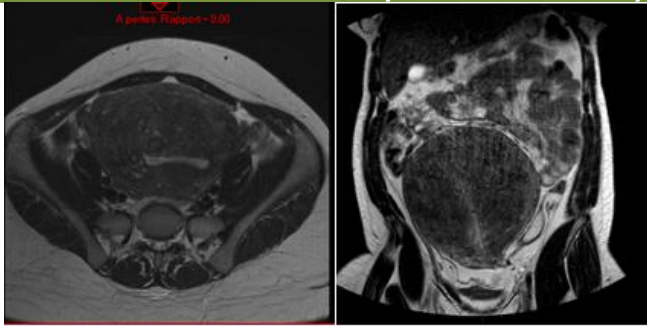


Figure 2: a b and c MRI axial, coronal and sagittal T2 sequence: adenomyosis characterized by diffuse thickening of the myometrium with nodular T2 hypersignals corresponding to crypts.

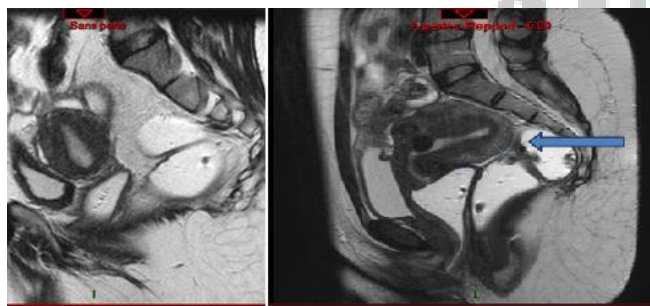


Figure 3: MRI sagittal T2 sequence thickening of the transitional zone: adenomyosis

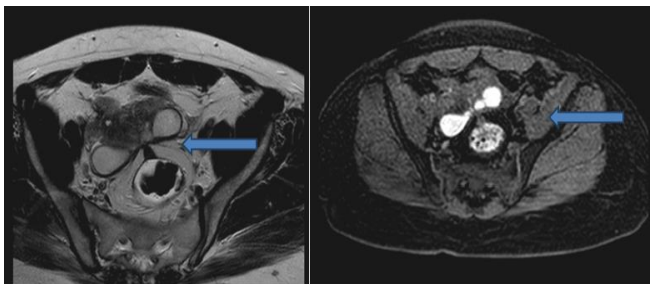


Figure 4: a and b: axial T2 and T1 fat sat sequence MRI: T2 and T1 fat sat hypersignal of the right and left ovaries with fibrous attraction of the 2 ovaries to the uterine fundus (KISSING OVARY), these are endometriotic cysts.

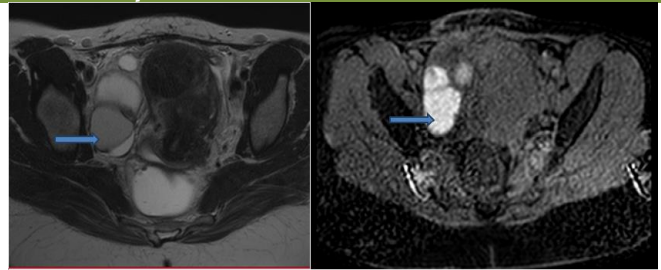


Figure 5: a and b: MRI axial sequence T2 and T1 FAT sat: right ovarian cystic mass with T2 hypersignal and T1fat sat compatible with an endometriotic cyst.

## Discussion

The average age of our patients during the time of diagnosis of endometriosis was 38.79 years. Our results were superior to those reported by Jarlot in France, where the average patient age was 31 years [7]. The high age of our patients could be related to the delay in diagnosing this disease in our work context, but also to the inaccessibility of MRI, which remains an expensive examination.

The suspicion of endometriosis was the most frequent indication in our series with 42.65% of patients. This result is due to a prior suspicion of this condition during a previous ultrasonography examination. Indeed, pelvic ultrasonography is the first-line examination for pelvic endometriosis.<sup>[8]</sup> For 26.47% of patients, the discovery of endometriosis was made by chance. This result is explained by the fact that endometriosis can be an often asymptomatic condition.<sup>[9]</sup>

In patients with adenomyosis, the junction area had a midline of 23 mm. This zone measured between 12 and 20 mm in 37.21% of our patients (Figure 2 and 3). According to Reinhold, its sensitivity and specificity are 86%.<sup>[10]</sup> This measurement makes it possible to suggest the diagnosis of adenomyosis, by its focal or diffuse thickening beyond 12 mm.<sup>[10]</sup>

T2-weighted images. Hearth of hyperintense in the thickened junctional area are characteristic of adenomyosis. The first localizations of endometriotic lesions were the uterus (adenomyosis) with 67.65% of cases. This localization was significantly associated with an older age. Compared with patients under 30 years of age, the risk of developing adenomyosis was 6.13 times higher in patients aged 30 to 40 years. In patients over 40 years of age, this risk was 16.62 with a p-value of 0.004. This result is in line with those of Deffieux and al. In fact, they estimated that the peak frequency of the disease was between 40 and 50 years.<sup>[11]</sup> In the literature, the risk factors for endometriosis documented are multiparity (and the existence of a genetic predisposition.<sup>[12,13]</sup> The ovaries are among the most common sites of endometriosis (20% to 40% of Ovarian endometriosis can manifest either in the form of superficial fibrotic implants associated with fibrous adhesions, or in the form of chronic retention cysts with cyclic bleeding (endometriomas).<sup>[14]</sup> On MRI, these ovarian cysts are hypersignal T2 and T1fat sat [Figures 4 and 5]. The ovarian localization was the second localization in order of frequency in our series. It concerned 35.29% of the patients.

It was a unilateral involvement in 25% of the cases and bilateral in 10.29%. The risk of developing an endometrioma decreased with increasing age. The associated odds ratio (OR) were 0.07 and 0.03 respectively for the age group 30 to 40 years and the age group over 40. However, proportions vary from study to another, and none of them found an association between age and ovarian involvement. Audebert,<sup>[15]</sup> and Yang,<sup>[16]</sup> and al reported respective proportions of 12.5 and 23.8%.

Tubal endometriosis is a relatively rare localization of endometriosis, it is seen in less than 5% of patients with endometriosis.<sup>[17]</sup> Tubal endometriosis was rare in our study, it represented 10.29% of cases. It was an intra tubal collection of T1, T2 and T1 fat sat hyperintense without and with injection of gadolinium.

Two types of locations are possible. The most frequent are the serous and subserous localizations, the endometrial tissue then sitting on the peritoneal surface of the uterine tubes, the rarest is the intra-luminal endometriosis in which the ectopic endometrium sits on the tubal mucosa.

Involvement of the torus and uterosacral ligaments is the most frequent of the subperitoneal localization. Detection of poorly marked forms is based on MRI, with the making of thin sections. Then, the lesions can appear in the form of a regular thickening of more than 3 millimeters or of an irregular or pseudo-nodular thickening, which the asymmetric nature increases the level of suspected involvement. The torus represented 13.24% of the subperitoneal locations. In the Carmella studies,<sup>[9]</sup> this involvement represented 6.4% of cases.

The prevalence of subperitoneal involvement was 19.12%. Involvement of the uterosacral ligament was the most frequent with a prevalence of 16.18%. The lesions of the torus and uterosacral ligaments had a hypointense on the various sequences.

In Chapron's series, the uterosacral ligament involvement was also the most frequent subperitoneal location with a prevalence of 57.6%, which is more than one in two subperitoneal involvement.<sup>[18]</sup>

Sigmoid involvement represented the majority of digestive locations in our study, same as Musanda, who found rectal location in 88% of cases.<sup>[19]</sup> This frequency could be explained by the proximity to the internal genitalia. bladder involvement was 1.47%. This proportion is closed to the one observed by Iben in Morocco with 1% of cases.

Endometriosis was associated with myomas in 44.12% of patients. An association of endometriosis and uterine fibroma has also been reported by Gautier. He had a prevalence of 46%.<sup>[20]</sup> But the greatest interest for the radiologist is not to overlook one of these two pathologies, which can be distinguished very well on MRI.

## Conclusion

MRI appears to be the reference imaging examination in the diagnosis and assessment of extension of pelvic endometriosis, because it offers the possibility of performing in one step a complete assessment of the compartments of the pelvis before laparoscopy. It should

allow a more general support of this frequent and painful pathology which is underestimated for a long time.

In sub-Saharan Africa and particularly in Ivory Coast, the diagnosis of endometriosis is made at an advanced age dominated by adenomyosis followed by endometriomas.

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