

Contribution of MRI in Extension Assessment of Cervical Cancer in Yaoundé (Cameroon)

Mbozo'o Mvondo Samuel^{1,2*}, Yannick Onana¹, Aminou Mohamadou¹, Jérémie Mbo Amvene¹, David Ngaroua¹, Genesis Eric Secvou¹, Mathurin Neossi Guena², Obi Fidelis Ayuk³, Ekobena Fouda², Odile Fernade Zeh⁴, Boniface Moifo⁴, Hamadou Ba¹, Samuel Nko'o Amvene⁴

¹Department of Radiology and Medical Imaging, Faculty of Medicine and Biomedical Sciences of Garoua, University of Ngaoundéré, Ngaoundéré, Cameroon

²Department of Biomedical Sciences, Faculty of Sciences, University of Ngaoundéré, Ngaoundéré, Cameroon

³Department of Radiology, Yaoundé Military Hospital, Yaoundé, Cameroon

⁴Faculty of Medicine and Biomedical Sciences, University of Yaoundé, Cameroon

Email: *smbozoo@hotmail.com

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Abstract

Background: Cervical cancer is one of the most common cancers, requiring a precise complementary assessment. The aim of this study was to contribute to the improvement of the management of cervical cancer by describing the MRI aspects of cervical cancer according to the IFOG-MRI classification. **Material and Methods:** This was a cross-sectional study, conducted in patients who came for clinical suspicion, extension assessment of histologically confirmed cervical cancer, from October 2020 to March 2021, in Yaoundé (Cameroon). **Results:** 54 patients were selected, with an average age of 50.4 years. Genital hemorrhage was the most frequent symptom (92%). The mean tumor size was 52.9 mm. According to IFOG staging, stages Ia, Ib, IIa, IIb, IIIa, IIIb, and IV accounted for 9.10%, 10.20%, 12.50%, 29.50%, 5.70%, 12.50%, and 20% respectively. No patient had known metastasis at the time of examination. **Conclusion:** MRI allows non-invasive, satisfactory tumor staging examination by providing information on tumor size, parametrium invasion, adjacent organ involvement, and the presence of lymph node metastasis.

Keywords

Cervical Cancer, Magnetic Resonance Imaging, International Federation of Obstetricians and Gynecologists

1. Introduction

Cervical cancer is one of the most common cancers, responsible for nearly 10

million deaths in 2020 according to the data of World Health Organization [1]. It is also a public health problem in developing countries, especially in sub-Saharan Africa where it occupies the first rank among women's cancers [2]. In Cameroon, in 2018, there were an estimated 2350 cervical cancers and 1540 deaths per year, according to the data of GLOBOCAN [3].

The occurrence of cervical cancer is primarily related to infection with oncogenic Human Papillomavirus (HPV). Other predisposing factors include early sexuality, multiple sexual partners, early conception, smoking, and immunosuppression [4].

The staging of the disease has always been determined by the International Federation of Obstetricians and Gynecologists (FIGO) classification, which does not take into account some important parameters such as lymph node involvement [5].

Very often, the prognosis remains poor due to late diagnosis and treatment that is often inappropriate to the stage of the disease that could have been done by earlier MRI [2].

Though the MRI remains a very cost and difficult accessible exam in our country, does it efficiently participate in the management of cervical cancer?

With the general aim of participating in the improvement of cervical cancer management in Cameroon, this study was carried out to precise the role of pelvic Magnetic Resonance Imaging (MRI) for the characterization of the tumor, its local and lymph node extension and its complementarity to the FIGO classification in Cameroon [6].

2. Material and Methods

2.1. Type of Study

It was a cross-sectional, descriptive study, over a period of 6 months (from October 8, 2020 to March 21, 2021), carried out in the Radiology and Medical Imaging Department of the Military Hospital of Yaoundé (HMY).

2.2. Study Population

The population consisted of patients admitted to the MRI department of the Yaounde Military Hospital (YMH) for pelvic or abdominal-pelvic MRI for clinical suspicion, or extension assessment of histologically confirmed cervical cancer, or for follow-up of treated cervical cancer. Patients with known renal insufficiency or contraindication to contrast media injection were excluded from our study.

2.3. Procedure

The magnetic resonance imaging protocol included T2 Blade sequences in the three planes, T1 Dixon, T1 FS, diffusion, axial and coronal TSE T2 sequences on the abdomen (lymph node exploration), as well as T1FS sequences in the three planes after contrast injection. The slice thickness was 4 - 5 mm, and the field of

exploration covered from the recto-sigmoid hinge to the pubic symphysis, including the iliac lymph nodes. The injected contrast medium was 50 cc of Gadolinium chelates.

We retrieved from the medical records on presenting complaints, initial clinical examination, MRI reports and images.

All MRI were reviewed by experienced radiologists.

2.4. Variables

The primary variables in this study were the pelvic MRI result. The imaging data collected were the presence of the tumor, its size, and the characterization of the tumor stage according to the IFOG classification [5] as well as lymph node involvement.

A tumor localized to the cervix was considered as stage I, a tumor with extension to parametrium and/or to the upper 1/3 of the vagina was stage II tumor, a tumor reaching the pelvic wall and/or lower 1/3 of the vagina and/or with presence of hydronephrosis was a stage III tumor, and the tumor with extension beyond the pelvis or attenuating the bladder and/or rectum was a stage IV tumor [5].

Secondary variables were socio-demographic data (age, geographical distribution, marital status, occupation), and clinical signs and symptoms.

2.5. Statistical Analysis

The data collected was processed through the following software: Microsoft Excel 2016 and IBM SPSS 23. The results are expressed in tables and figures, as mean and percentage.

3. Results

3.1. Study Population

A total of 54 patients were included in our study, with a mean age of 50.5 years. The most represented age group was 50 - 64 years (38.90%, n = 21), as shown in **Figure 1**. 55.60% (n = 30) of these patients lived in rural area, 59.6% (n = 31) of them were married, and 25% (n = 15) were widows. Housewives represented 51.9% of the patients (n = 28).

3.2. Clinical Data

The vast majority of our patients (55%, n = 30) consulted on average 6 months after the onset of symptoms.

Table 1 shows the different functional signs, which were dominated by metrorragia (92.5%, n = 50).

3.3. Pelvic MRI Findings

Figure 2 summarizes the IFOG tumor stages obtained in the 54 patients of our study population. Stage IIB was the most encountered (29.5%, n = 26).

Table 1. Distribution of cases by clinical signs.

Clinical manifestations	Number	Percentage
Metrorrhagia	50	92.5%
Pelvic pain	15	26.7%
Leucorrhoea	08	15.7%
Other signs	06	11.1%

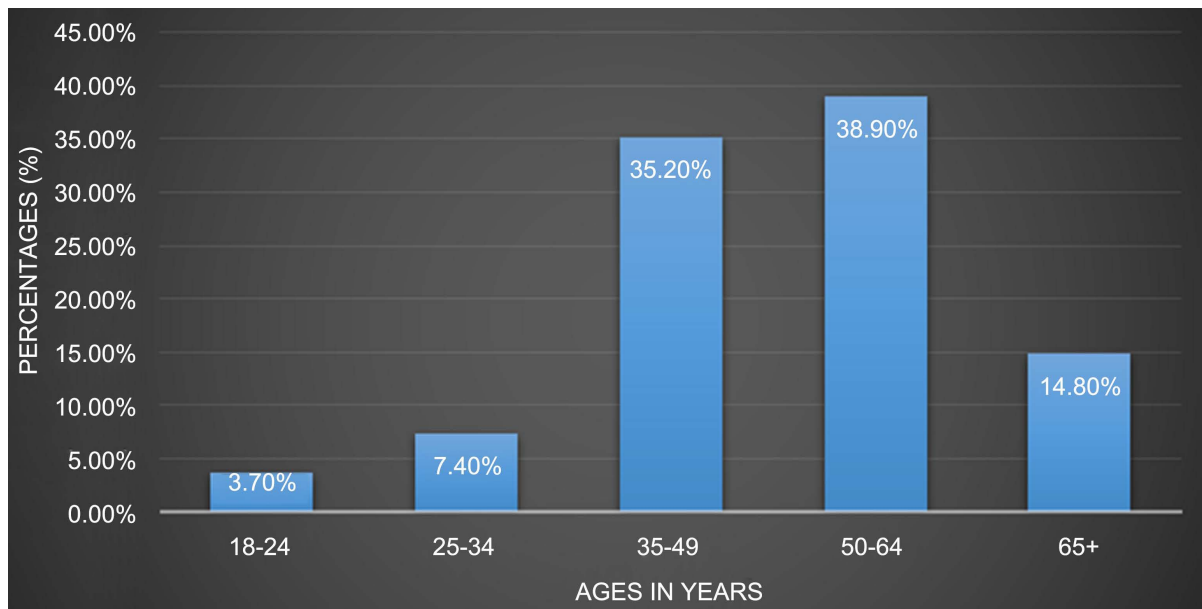


Figure 1. Age distribution.

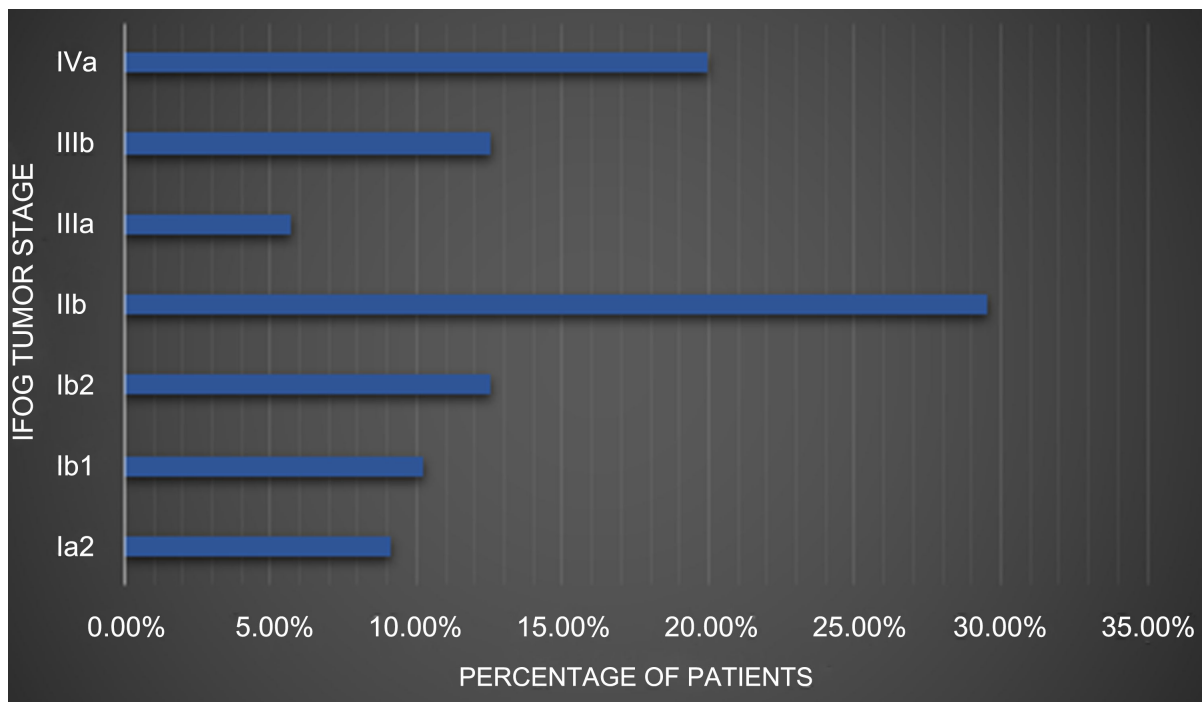


Figure 2. Distribution of patients according to IFOG tumors stages.

Tumors limited to the cervix accounted for 26.7% (n = 14). Parametrium invasion was unilateral in 13.6% (n = 12) patients. Tumors involving the pelvic wall with associated hydronephrosis were present in 12.5% of cases (n = 11).

Lesions involving the bladder and/or rectum were present in 20.4% of cases (n = 18), as shown in **Figure 3**. No patient had metastasis at the time of examination.

Concerning lymph node involvement, the internal and external iliac chains were invaded in 33.3% (n = 18 patients), followed by the retroperitoneal areas in 20.4% (n = 11).

Figure 4 and **Figure 5** present some illustrative stage of cervical cancer.

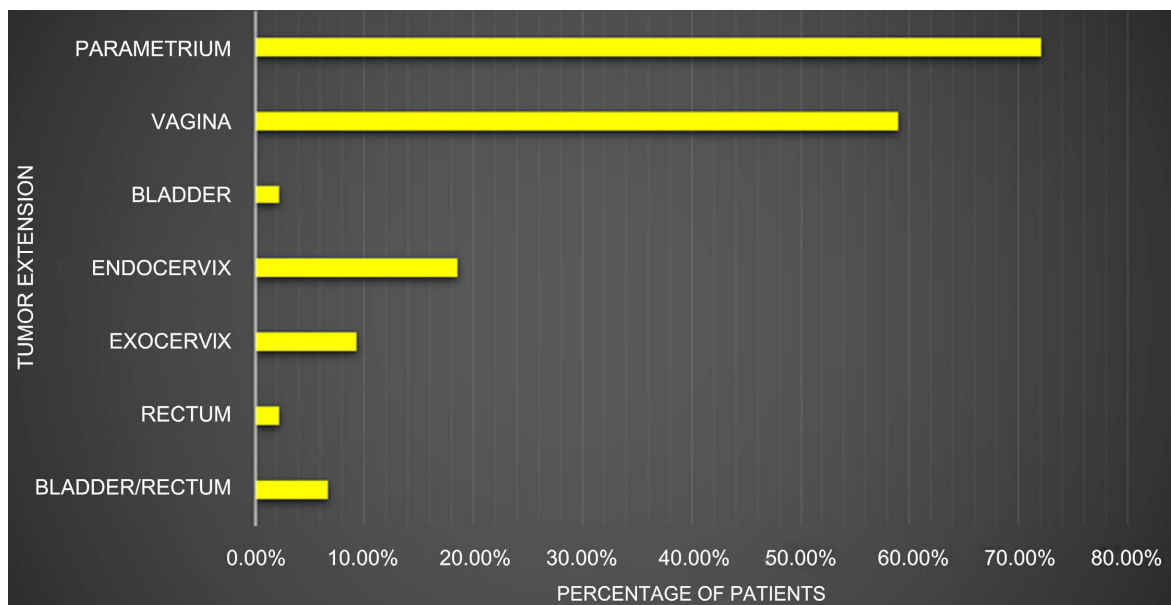


Figure 3. Distribution of patients according to loco-regional extension of tumors.

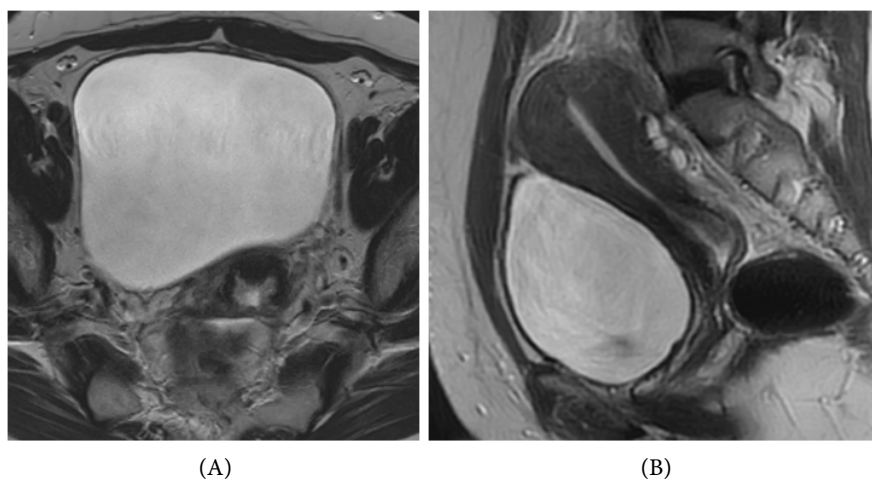


Figure 4. Cervical cancer classified as stage IB, tumor lesion of the posterior lip of the cervix. This Pelvic MRI of a 39-year-old woman, T2-weighted axial (A) and T2 sagittal (B) sequences, showing poorly delineated tissue area invading the stroma of the posterior lip of the cervix in intermediate T2 signal.

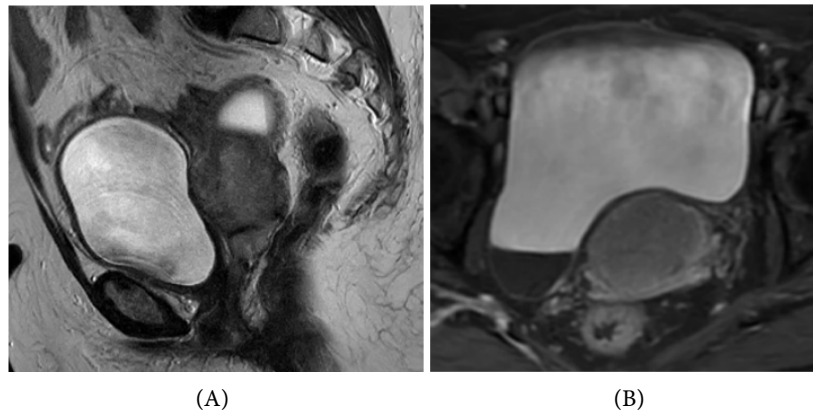


Figure 5. Cervical cancer classified as stage IIB IFOG classification Pelvic MRI of a 61-year-old woman, sagittal T2-weighted (A) and axial T1 FS + Gadolinium (B) sequences: Cervical lesion ($46 \times 41 \text{ mm} \times 40 \text{ mm}$ height), poorly delimited, intermediate T2 signal, heterogeneously enhanced after IV PDC. It crosses the isthmus and invades the upper part of the vagina. Hydrometry is retained, and bilateral parametrial invasion, predominantly on the left.

4. Discussion

Cervical cancer is the most common cancer in Cameroon, as well as the leading cause of cancer death in women, as in most sub-Saharan African countries, which do not have a nationwide mass screening program [2] [3].

4.1. Study Population

In our series, the mean age at diagnosis was 50.5 years. The age group most affected was 50 - 64 years (38.90%). This result is similar to that of Aboubacar Keita *et al.* who found an age of 52 years in Mali [7], and differs moderately from that of El Ghorfi in Morocco *et al.* who found an age of 59 years [6]. However, in general, the early onset of cancer in sub-Saharan Africa has already been highlighted by many authors [2] [8].

Most of our patients lived in rural areas (55.60%), as pointed out by Faye *et al.*, who found a greater proportion of women living in rural areas (84.4%) in Senegal [9], the rural area is characterized by the scarcity of screening and awareness campaigns.

4.2. Clinical Data

The major revealing sign was essentially metrorrhagia found in 92% of cases, which could be provoked or spontaneous. This result is similar to what Aboubacar *et al.* found in Mali metrorrhagia in 98.8% of cases [7].

According to our results, the delay of consultation is long, 55% of the patients consulted after 6 months of evolution, similar to the results of Kouskous *et al.* who found 57.9% in the city of Fez [10].

4.3. Pelvic MRI Findings

The MRI maximum tumor diameter in this study was 52.9 mm (30 - 79 mm) on

average. This differs slightly from the results of El Ghorfi *et al.*, who founded 61 mm [6].

Although the estimation of tumor size remains clinical, MRI is of major contribution to improve the definition with an accuracy of 95% [4].

Paramedic invasion represented 72.2% of cases. Our data are similar to those of Kouskous *et al.* in Fez who found 68% parametrial invasion [10].

As pointed out by Shweel *et al.*, parametrial invasion is an important criterion in the preoperative workup [11] [12]. However, there is a risk of overestimation due to peritumoral edema in the case of voluminous involvement [11] [13] [14].

MRI has a specificity of 97%, and a negative predictive value of 100% for parametrial invasion [15].

Regarding the classification used, which was that of IFOG, we obtained the following results: stage IA (9.10%), stage IB (10.20%), stage IIA (12.50%), stage IIB (29.50%), stage IIIA (5.70%), stage IIIB (12.50%), and stage IVA (20%).

Similar proportions in severe forms were found by Ghorfi *et al.* (32%) [6] and Shweel *et al.* in Egypt (26.6%) [11].

This similarity of severe forms could be explained by the difficulties encountered in the health systems of developing countries in terms of mass screening, particularly in Cameroon where 62.9% of cervical cancers are diagnosed at an advanced stage [16].

Concerning lymph node involvement, retroperitoneal areas were invaded in 20.4% of cases, which is a poor prognostic factor, and is equivalent to extrapelvic tumor extension (stage IVB), according to some authors [11] [17].

The limitation of this study was the small size of our sample, probably due to the monocentric nature of our work.

5. Conclusions

MRI has an important contribution to the evaluation of cervical cancer. It has been shown to complement the clinical examination by providing information on tumor size, parametrial invasion, adjacent organs involvement, and the presence of lymph node metastasis. Thus, MRI allows non-invasive is satisfactory in tumor staging.

Therefore, IRM is the reference examination for planning, choice of treatment, and search for possible tumor recurrence [7]. However, its relatively high cost and poor accessibility in our geographical context seem to be limiting factors, as in Cameroon.

A larger size of sample study would help to generalize our results in our context.

Author Contributions

All authors contributed to the writing, read and approved the final version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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