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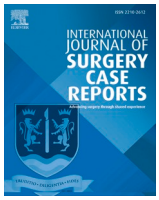

Case report

Uterine leiomyoma in a 16-year-old young adolescent from Northen Tanzania: A rare case report and review of current literature

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ABSTRACT

Introduction and importance: Uterine leiomyomas, or fibroids, are benign mesenchymal tumors, which represent the most common tumors of the female genital tract. Their occurrence in pediatric and adolescent populations is uncommon, and relatively few cases have been documented in the literature, particularly in lower-resourced settings. This case highlights the importance of recognizing that although uncommon, fibroids can occur in much younger populations. Also highlights the need for healthcare practitioners in resource-limited environments to be vigilant in considering leiomyoma in differential diagnoses, even in younger patients, and to adapt their treatment approach given the constraints of local healthcare systems.

Case presentation: Here we present an uncommon case of uterine leiomyoma in a 16-year-old female from Northern Tanzania. She presented with lower abdominal pain associated with abdominal distension, prolonged menses, headache, and anemia. Transvaginal US and pelvic MRI were performed and revealed an enlarged uterus with a heterogeneous mass in the posterolateral uterine wall. Myomectomy was performed, and post-operative recovery was uneventful. The final histopathological report confirmed the diagnosis of intramural uterine leiomyoma.

Clinical discussion: In this report, we discuss the rarity of this condition, the literature surrounding similar reports, and the many challenges that arise in the management of leiomyoma in a young adolescent population.

Conclusion: Uterine leiomyomas should be considered as a differential diagnosis in pediatric and adolescent females presenting with a pelvic mass and abdominal pain. Though there are no specific guidelines for treatment, management of leiomyomas in this age group, should be conservative and based on symptom severity with the goal of preserving fertility.This case underscores the need for more research and awareness of uterine leiomyomas in adolescents to improve understanding and management of this rare condition in this age group, particularly in regions like Northern Tanzania where access to healthcare may be limited.

1. Introduction

Uterine leiomyomas (ULs), or fibroids, are the most common pelvic neoplasms among females, resulting in severe symptoms and reduced quality of life for women around the world [1,2]. Overall prevalence is estimated at 4 %–11 % of the general female population, though up to 77 % of women will develop ULs in their lifetime [3,4]. The frequency of ULs rises with age, and black women tend to be affected at least twice as often as white women [5]. A large portion of affected women suffer from severe symptoms including pelvic discomfort, dysmenorrhea, menorrhagia, anemia, and incontinence [4–6]. Uterine fibroids can also cause infertility and are an independent risk factor for several adverse perinatal outcomes such as preterm birth, obstructed labor, growth restriction, low birth weight, placental abnormalities, cesarean section, and postpartum hemorrhage [7].

Although ULs occur frequently in the general female population, they are rarely diagnosed in children and adolescents, contributing to a lack of published data or case reports discussing proper diagnosis and

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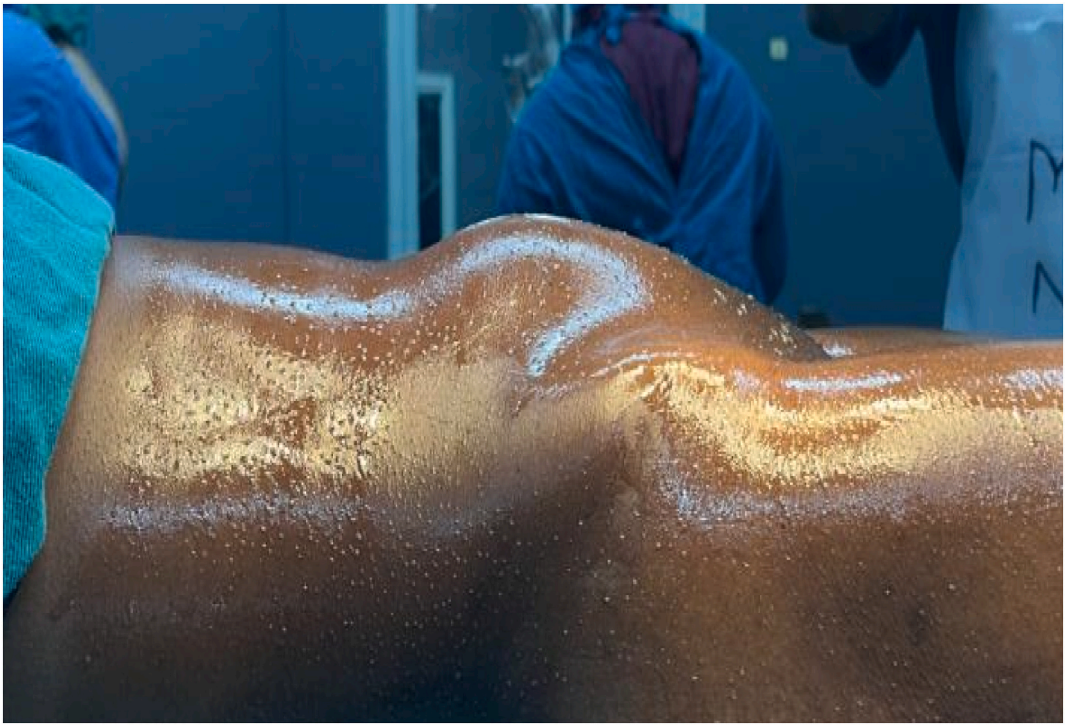

Fig. 1. Abdominal examination revealed a distended abdomen with a palpable suprapubic mass.

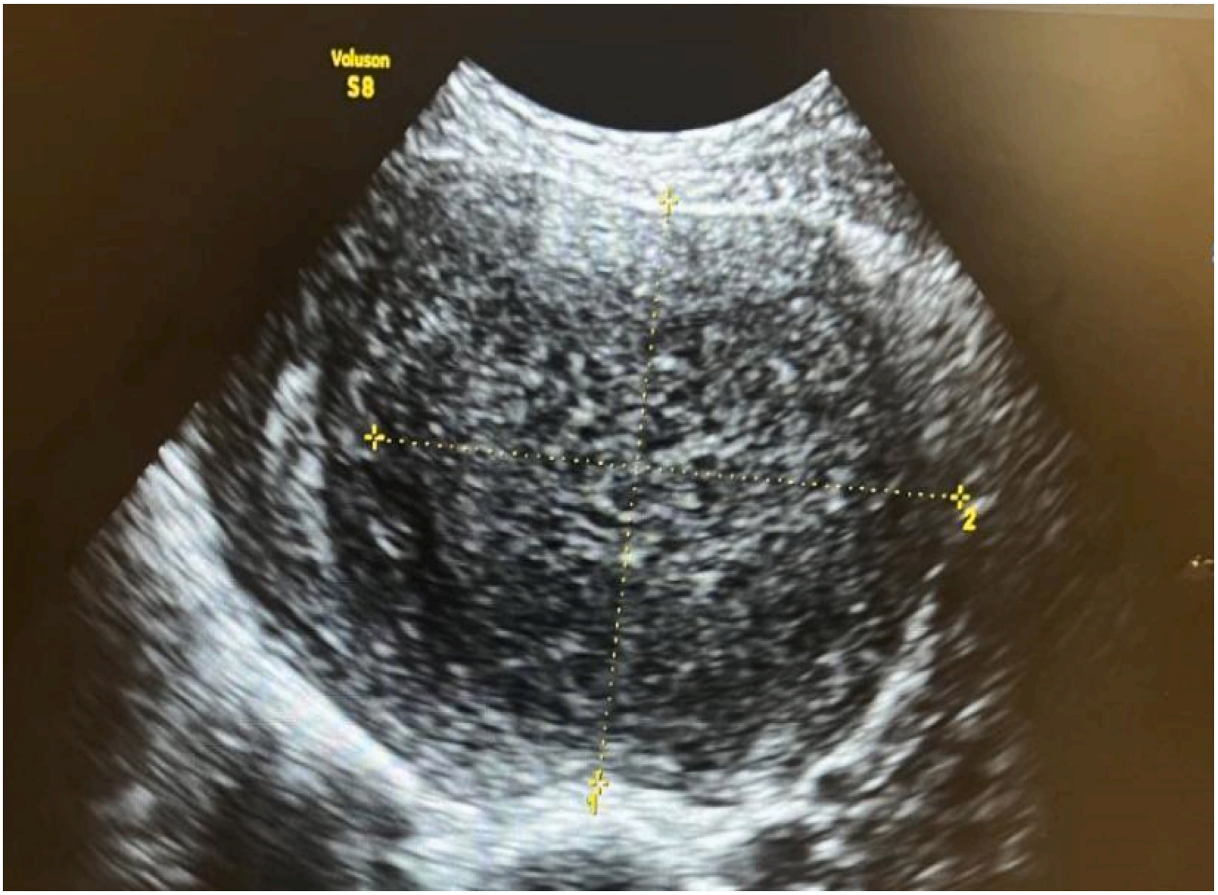

Fig. 2. Transvaginal ultrasound demonstrating an enlarged uterus with a well-circumscribed, heterogeneous lesion in the myometrium measuring 9.8 × 8.7 cm.

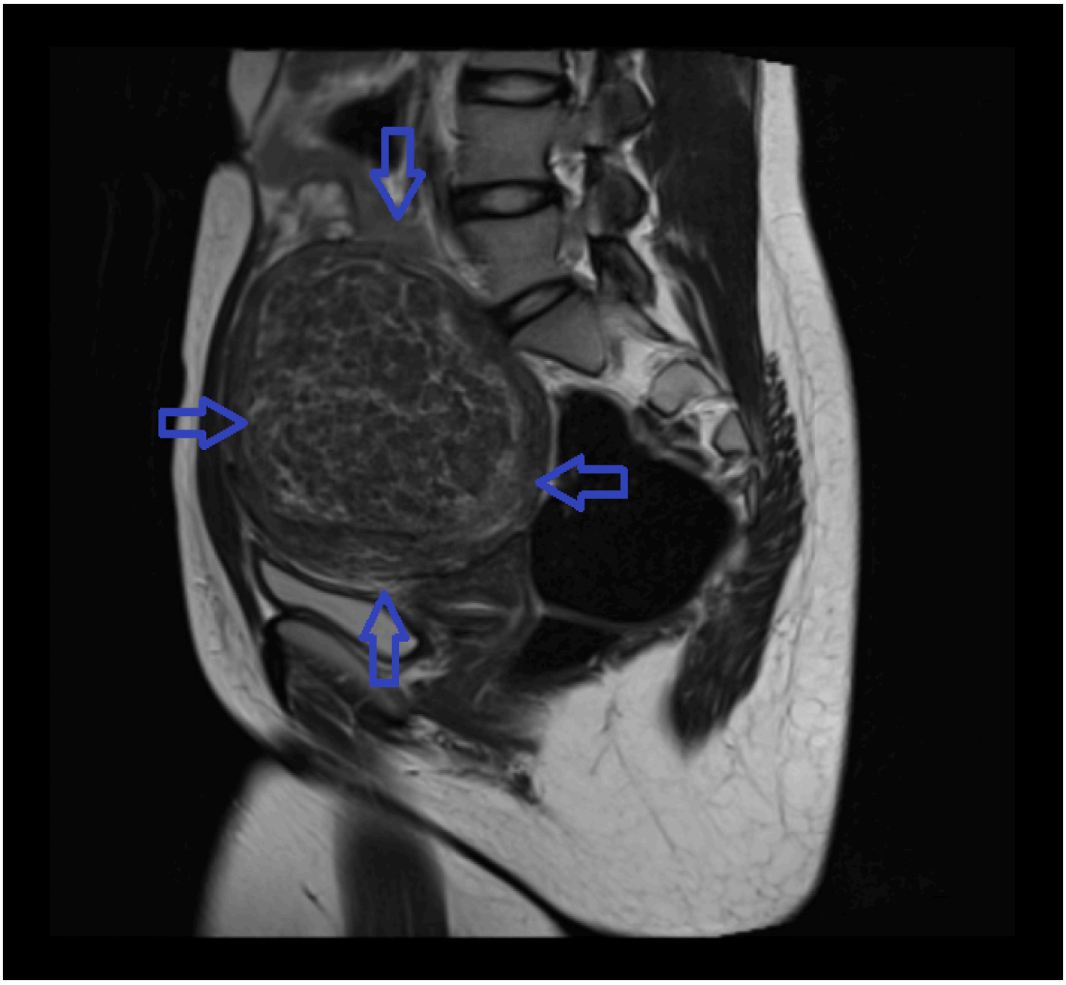

Fig. 3. MRI sagittal view revealing a complex, heterogeneous lesion (indicated by the arrows) in the posterolateral intramural uterine wall measuring 10 × 7 × 9 cm.

management for patients in these age groups [8,9]. There are only a few reports of fibroids affecting prepubescent children, including two autopsy reports of uterine leiomyomas in a 1-year-old child and an 8-year-old child [10]. It seems that fibroids in pediatric and adolescent populations tend to be asymptomatic, so affected individuals rarely present to medical attention [11]. The biological behavior of ULs in the pediatric and adolescent age group is unknown, and optimal treatment approaches are debated. In this report, we describe an uncommon case of a uterine leiomyoma in a 16-year-old girl who presented to our referral hospital in Northern Tanzania with lower abdominal pain and irregular menses and was ultimately managed surgically. This work has been reported in line with the SCARE criteria [21].

2. Case report

A 16-year-old female presented to our referral hospital with a 3-month history of lower abdominal pain with abdominal distension, back pain, prolonged and heavy menses, headache, dizziness, and heart racing. She denied any changes in bladder or bowel habits. She had no significant past medical or surgical history and no previous pregnancies. She had no history of alcohol intake or tobacco use. She reported being sexually active and living with her parents. The patient reported that she started menarche at 12 years old and has a regular cycle of 28 days with bleeding lasting for 7 days. During this week of bleeding, she has to change her pad about four times a day due to them being completely soaked through. She has negative personal and family history of ovarian, uterine, bowel, and breast cancers.

On examination, she was alert and oriented though noticeably uncomfortable. She was mildly pale, without jaundice, cyanosis, or edema. All vital signs were normal. Abdominal examination revealed a palpable mass in the suprapubic area, corresponding with 12 weeks of gravid uterus, of which was firm, globular, and an estimated 8 × 7 cm on palpation (Fig. 1). On speculum examination, the cervix was closed and appeared normal without inflammation or discharge. Our leading differential diagnoses at this time included ovarian mass, müllerian adenosarcoma, and sarcoma botryoides. Pregnancy was promptly ruled out with a negative urine pregnancy test. Additional routine laboratory tests were notable for a hemoglobin level of 6.6 g/dL and platelets of 450,000/mcL. Other laboratory parameters, including blood glucose, liver enzymes, renal function tests, and electrolytes, were within normal limits. Similarly, CA 125 and CEA were within normal limits. Electrocardiogram showed normal sinus rhythm.

A transvaginal ultrasound (TVUS), demonstrated an enlarged uterus with a well-circumscribed, heterogeneous lesion measuring 9.8 × 8.7 cm within her uterus (Fig. 2). Both ovaries appeared normal. Subsequent pelvic magnetic resonance imaging (MRI) revealed a heterogeneous lesion in the posterolateral myometrium of the uterus measuring 10 × 7 × 9 cm (Fig. 3). A minimal fluid collection was noted in the endometrial cavity, with no changes in the overlying endometrial lining. The findings from the radiology review were consistent with intramural leiomyoma.

Considering fertility preservation and cost-effectiveness, the decision was made to perform an abdominal myomectomy. During surgery, intraoperative we noted a significantly enlarged uterus (Fig. 4). A Foley catheter was applied on the isthmus as a tourniquet, and a vertical

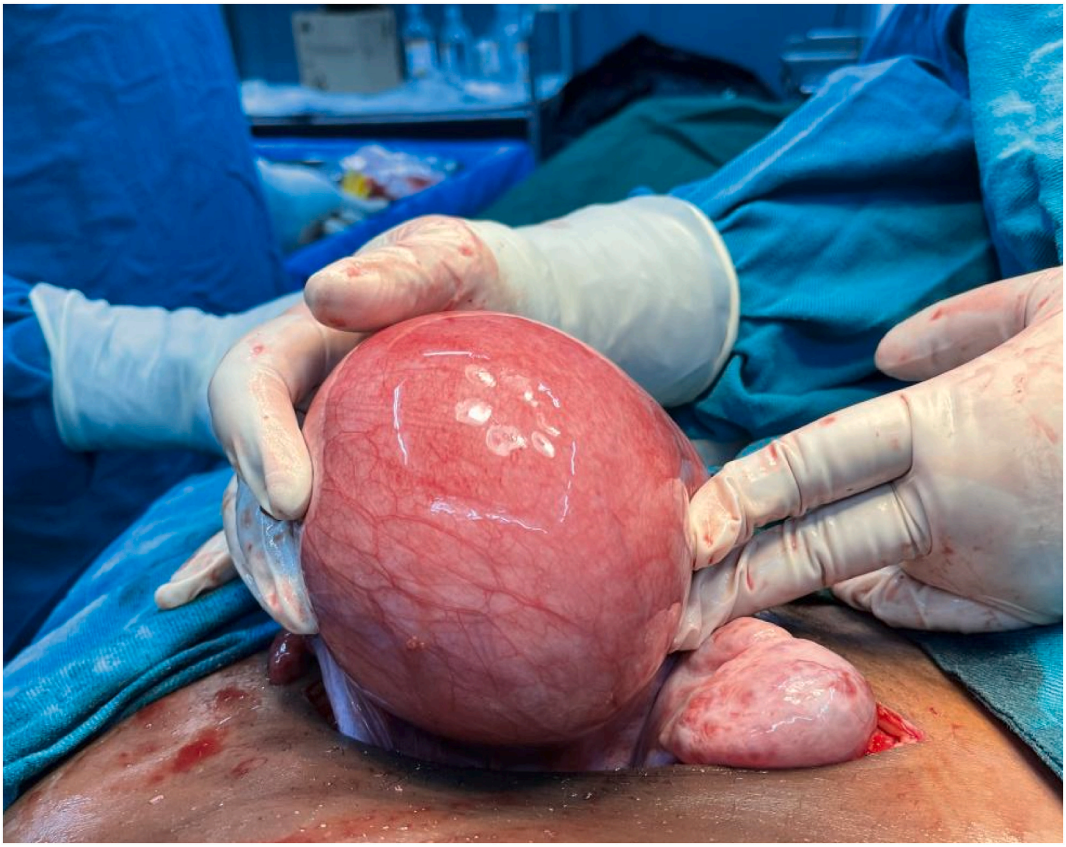

Fig. 4. An intraoperative image showing the enlarged uterus encountered after removing the uterus inside the abdomen.

incision was made on the posterior wall of the uterus. There was a solitary mass at this location with smooth borders and no nodularity, It measured 10 × 10 cm with multiple cystic lesions on the surface. The mass was removed without entering the endometrial cavity, then the uterus was repaired, the tourniquet was removed, and hemostasis was achieved. The specimen was submitted for histopathology evaluation (Fig. 5A & B). The tumor was composed of diffuse proliferation of intersecting fascicles of monotonous spindle-shaped cells with eosinophilic cytoplasm (Fig. 6A & B). This morphology was consistent with leiomyoma.

Her postoperative course was uneventful, and she was ready for discharge by postoperative day three. She was counseled about the risk of recurrence, future fertility, and avoiding pregnancy for at least one year following the surgery. Her follow-up visit was planned for 2 weeks later, and the patient was healing well after surgery with minimal bleeding. At her 3-month follow-up visit, she reported regular and painless menstrual cycles, and repeat transvaginal US showed no recurrence of the mass.

3. Discussion

This case report describes an uncommon case of a uterine leiomyoma in an adolescent female who presented for care in Northern Tanzania. Given the infrequent nature of ULs in a younger population, our initial clinical impression was ovarian mass, as this would be much more common in an adolescent female. However, following radiological investigations and surgical interventions, we were able to definitively confirm the diagnosis of uterine leiomyoma with surgical pathology. In this report, we discuss the rarity of this condition, the literature surrounding similar reports, and the many challenges that arise in the management of leiomyoma in a young adolescent population.

The prevalence of ULs in Eastern Sub-Saharan Africa (SSA) is estimated at 195.03 cases per 100,000 individuals, with this rate being lower than that of regions with higher sociodemographic indices such as in the United States and Europe [12]. Such estimates may underestimate the true burden of disease, as lower resourced settings tend to lack adequate medical resources and technology for reliable diagnosis and awareness of the condition may be limited. For pediatric and adolescent populations, there are no reliable prevalence estimates for ULs in this age group in SSA or globally.

Many risk factors are associated with the development of fibroids, such as nulliparity, obesity, pregnancy, and early menarche, with exposure to estrogen as the alleged mechanism of this risk [6]. African American race, family history, significant alcohol use, tobacco use, and red meat intake are also found to be associated with a higher incidence of ULs [5,13]. Pregnancy and obesity were excluded in our patient as well as any history of alcohol, tobacco or exogenous estrogen use. The exact etiology of uterine fibroids is unknown, though increased estrogen exposure and hereditary components may contribute to their pathophysiology [6,14]. Indeed, chromosome 6, 7, 12, and 14 mutations within tumor cells have been observed to occur frequently within these mesenchymal tumors, and positive family history is a known risk factor for fibroid development [6]. Nevertheless, the precise causes of leiomyoma formation remain unclear.

It is unknown whether pediatric and adolescent cases of ULs are related to these same factors or represent a different entity entirely. It has been suggested that leiomyomas might originate from intrinsic anomalies in the myometrium, from congenitally elevated levels of sex steroids, or from endometrial injury acquired during menstruation [6]. Each of these theories is reasonable and may explain the appearance of such tumors in adolescents after menarche, when endometrial sloughing and sex steroid production have occurred. Such theories do not explain why certain lesions may occur earlier in a female's lifespan or cause more severe symptoms.

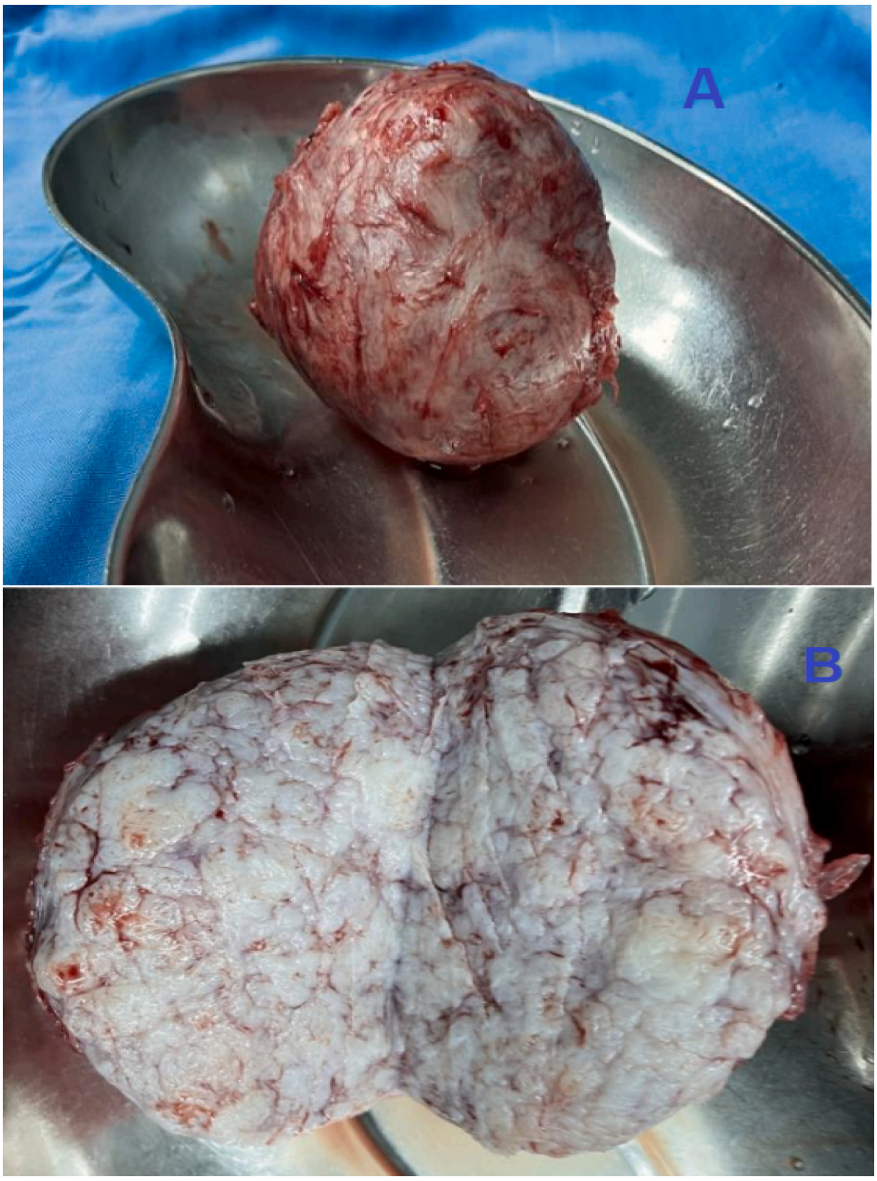

Fig. 5. Images of the specimen that was taken for histopathology: (A) lateral view; (B) intralesional sagittal view.

The clinical presentation of ULs is highly variable, depending on tumor characteristics and patient factors. It is estimated that about 50 % of uterine fibroids are asymptomatic, though asymptomatic cases are likely underreported [15]. Among symptomatic women, the most frequently observed complaints are irregular or intense uterine bleeding and pelvic in addition to bulk symptoms related to tumor compression, such as urinary frequency or urgency [5,6]. The vast majority of UL cases in younger patients tend to be symptomatic (up to 87.5 %), and the presentation of such lesions among adolescents appears to be similar to that of the general population [11]. The availability of case reports of ULs in younger females is limited, likely due to lower prevalence in this age group as well as higher frequency of undiagnosed and asymptomatic cases.

In evaluating a patient for uterine fibroids, one should begin with abdominal and pelvic examinations. On bimanual pelvic examination, the size, contour, and mobility of the uterus should be noted. An enlarged, mobile uterus with an irregular contour is consistent with a leiomyomatous uterus.

In low-resource settings like Northern Tanzania, access to advanced imaging techniques such as high-resolution ultrasound, MRI, or CT scans is often limited. Basic diagnostic tools may be available only in larger urban centers, meaning rural or community clinics may not have the necessary equipment to detect uterine abnormalities accurately. Subsequent diagnosis can be made with fair accuracy via high frequency US or MRI. Transvaginal ultrasound alone has a high sensitivity (95–100 %) for detecting ULs <10 weeks gestational size [16]. Due to its accuracy, affordability, and accessibility, ultrasonography should be used as the first-line diagnostic study when leiomyomas are suspected [17]. MRIs are the most effective modality for assessing soft tissue tumors, though their use may be limited in low-resourced settings or avoided to decrease patient costs [16,17]. MRIs are particularly useful for discriminating tumor types and for surgical planning, specifically to determine the expected depth of the fibroid into the myometrium and to localize the uterine arteries for potential embolization.

Treatment of ULs in the general population consists of medical or surgical interventions, or a combination of both. Asymptomatic fibroids may be left untreated, though are monitored closely with serial exams and US. For women with symptomatic fibroids or impaired fertility, medical treatments, such as Gonadotropin-Releasing Hormone analogues, can be utilized to reduce the size of the mass to relieve symptoms

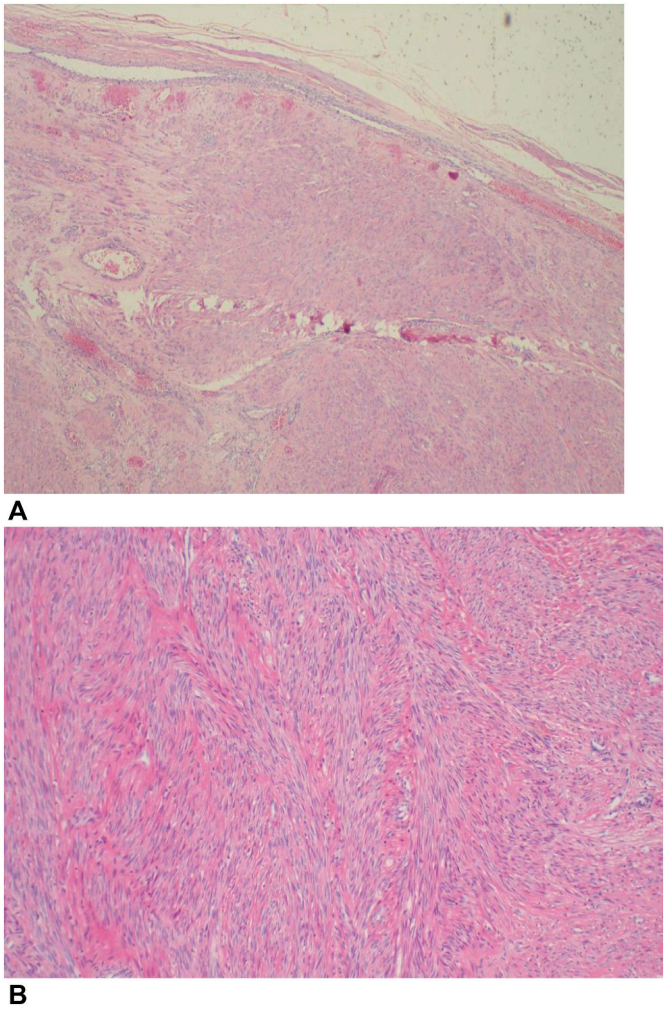

Fig. 6. A: Histopathology of the leiomyoma showing a circumscribed lesion with well-defined borders. The tumor is composed of a diffuse proliferation of intersecting fascicles of monotonous spindle shaped cells with eosinophilic cytoplasms. H&E staining at 40 x original magnification. B: Photomicroscope image demonstrating intersecting fascicles of smooth muscles made up of spindle-shaped cells that lack atypia and mitoses. H&E staining at 100 x original magnification.

or make subsequent surgery easier and safer [19]. Medical management with hormonal treatments was not applied to our patient due to availability in our settings, even when available, these medications might be costly or inconsistently supplied, making sustained medical management challenging. For other patients, surgical intervention may be preferable, particularly for severe symptoms or infertility. Surgical treatment typically consists of minimally invasive techniques, such as myomectomy or uterine artery embolization, though definitive treatment via hysterectomy is an option as well [1,2,5]. Laparoscopic and abdominal approaches to these surgeries are reasonable, as they have similar efficacy and recurrence rates, though postoperative pelvic adhesions are more likely following abdominal myomectomy than laparoscopic [20]. In low-resource settings, adolescents with uterine fibroids, like the 16-year-old in our case, require treatments that prioritize fertility preservation. Options like laparoscopic surgery (which minimizes uterine damage) may not be available due to a lack of trained specialists, costs or equipment. Invasive surgeries such as myomectomy could be the only option in some cases, which is particularly concerning in young patients with future fertility aspirations. In our case we performed an abdominal myomectomy, as the patient was unable to afford laparoscopic surgery.

When treating fibroids in adolescence, recommendations are limited to the few reported cases and review articles, and there are no specific guidelines for management. While it may be reasonable to approach pediatric and adolescent patients similarly to older women, such methods lack sufficient evidence, and little is known about their applicability in this younger age group [11]. Based on the available literature, surgical removal of a symptomatic leiomyoma tends to be the therapy of choice in adolescent patients [8,9,18]. This typically includes a myomectomy with the objective of preserving fertility, a particular concern for younger patients. In one reported case, a large pelvic mass in an adolescent was initially interpreted as an ovarian neoplasm, and only during laparotomy the diagnosis of uterine leiomyoma was made and a myomectomy carried out [18]. This highlights the need to create a comprehensive differential diagnosis for pelvic masses in adolescents and children, which should include uterine tumors despite their rarity. Of course, an increase in abdominal volume due to a pelvic mass should raise high suspicion for an adnexal tumor as well given their higher prevalence in this age group.

Our case highlights that ULs should be considered as a differential diagnosis in pediatric and adolescent females presenting with a pelvic mass, abdominal pain, and menstrual irregularities. Preoperative imaging is crucial for accurate detection, localization, and characterization of ULs. Though there are no specific guidelines for treatment, management of ULs in pediatric and adolescent patients should be conservative and based on symptom severity with the goal of preserving fertility. Affected patients should be properly counseled regarding future fertility, recurrence following treatment, family planning options, and the importance of early and frequent antenatal visits when pregnant. Specific guidance for subsequent monitoring and follow-up are lacking.

4. Conclusion

Uterine leiomyomas should be considered as a differential diagnosis in pediatric and adolescent females presenting with a pelvic mass and abdominal pain. Preoperative imaging evaluation is crucial for the accurate detection, localization, and characterization of uterus leiomyomas. Though there are no specific guidelines for treatment, management of leiomyomas in this age group should be conservative and based on symptom severity with the goal of preserving fertility.This case underscores the need for more research and awareness of uterine leiomyomas in adolescents to improve understanding and management of this rare condition in this age group, particularly in regions like Northern Tanzania where access to healthcare may be limited.

Consent

Written informed consent was obtained from the patient to publish this case report and accompanying images. On request, a copy of the written consent is available for review by the Editor in-Chief of this journal.

Ethical approval

This case report was approved by the authors' institution review board committee.

The patient provided written informed consent to allow for her de-identified medical information to be used in this publication. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Guarantor

Dr. John Lugata.

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Author contribution

All authors made substantial contributions to this work.

John Lugata: Conceptualization, study design, prepared initial manuscript version and approved the final manuscript draft.

Caleigh Smith: Conceptualization, study design, prepared initial manuscript version and approved the final manuscript draft.

Raziya Gaffur: Involved in the patient management, provided supervision and reviewed, and approved the final manuscript draft.

Bariki Mchome: A lead Obstetrician and Gynaecologist, provided expertise throughout the entire process and revised and approved the final draft.

Alex Mremi: Conceptualization, and also performed histopathological analysis and prepared the final manuscript draft.

Fredrick Mbise: Involved in the patient management, provided supervision and reviewed, and approved the final manuscript draft.

Conflict of interest statement

All authors have declared that no competing interests exist.

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