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Retroperitoneal Leiomyoma in a Man Under Feminization Therapy: A Rare Case Report

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ABSTRACT

Retroperitoneal leiomyomas are rare, benign, hormone-sensitive tumors that are particularly uncommon in male patients. This report presents the case of a 41-year-old male undergoing feminization therapy, who was diagnosed with a retroperitoneal leiomyoma associated with Denonvilliers' fascia. Imaging studies revealed a large, solid, homogeneous mass with characteristics resembling muscular tissue, maintaining clear interfaces with the surrounding structures. Immunohistochemical analysis identified spindle-shaped cells positive for smooth muscle actin and estrogen receptors. This case contributes to the limited literature on retroperitoneal leiomyomas in male patients, highlighting the potential association between feminization therapy and tumor development or accelerated growth and underscoring the need for further research in this area.

Keywords: Man, Retroperitoneum, Abdominal, Leiomyoma, Hormone Replacement Therapy.

INTRODUCTION

Leiomyomas are benign mesenchymal neoplasms that arise from smooth muscle cells and are commonly found in the uterus. Extrauterine leiomyomas, particularly those located in the retroperitoneum, are exceedingly rare, especially in individuals assigned male at birth [1]. When present, primary pelvic retroperitoneal tumors are more often malignant, and benign smooth muscle tumors in this region are typically of gynecological origin [1, 2]. As such, the occurrence of retroperitoneal leiomyomas in male patients is considered unusual [2].

Histopathological studies have shown that these tumors frequently express estrogen (ER) and progesterone receptors (PR), suggesting that they may originate from hormonally sensitive smooth muscle cells of the abdominal cavity or from embryologic remnants such as the Müllerian duct [2]. This receptor profile becomes particularly relevant in the setting of prolonged exposure to exogenous estrogen, such as during gender-affirming hormone therapy (GAHT).

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There is limited literature on primary retroperitoneal leiomyomas in males, with only nine cases reported to date [2, 3]. Importantly, none of these cases occurred in individuals undergoing GAHT. This lack of documentation highlights a critical gap in the literature and underscores the importance of disseminating such cases to raise awareness among clinicians and inform future research on the systemic effects of long-term feminizing hormone therapy.
In this report, we present a rare case of pelvic retroperitoneal leiomyoma in a transgender woman in her fifth decade of life, who received long-term GAHT. This case offers a novel perspective on the possible relationship between GAHT and the development of hormonally responsive mesenchymal tumors, reinforcing the need for ongoing clinical vigilance and research in transgender healthcare.

CASE REPORT

A 41-year-old male patient without comorbidities had been receiving intramuscular algestone and estradiol (150/10 mg) every 15 days for five years as part of GAHT. Six months before admission, the patient experienced progressive abdominal distension, occasional diarrhea, and dysuria, initially treated symptomatically as nonspecific colitis with partial improvement. The patient later presented to the emergency department with acute urinary retention of 48 hours' duration and moderate, oppressive pain in the upper abdomen. No additional symptoms were noted. On physical examination, a large abdominal mass of apparent pelvic origin was detected, which was initially suspected to be a distended bladder. Ultrasound (US) revealed a large solid mass in the pelvic cavity, raising the suspicion of a prostatic versus rectal tumor compressing the bladder. Owing to repeated episodes of urinary retention, a semi-permanent transurethral catheter was placed, and outpatient imaging studies were ordered.

A 64-slice contrast-enhanced multidetector abdominopelvic computed tomography (CT) scan showed a well-defined, solid, pear-shaped mass with homogeneous attenuation (average, 32 HU) and minimal contrast enhancement (up to 40 HU). The mass measured 152×86×90 mm and extended into the abdominal cavity, forming obtuse angles with adjacent organs and displacing vascular structures laterally, as well as collapsing and anteriorly displacing the rectum and bladder, without signs of invasion (Figure 1).

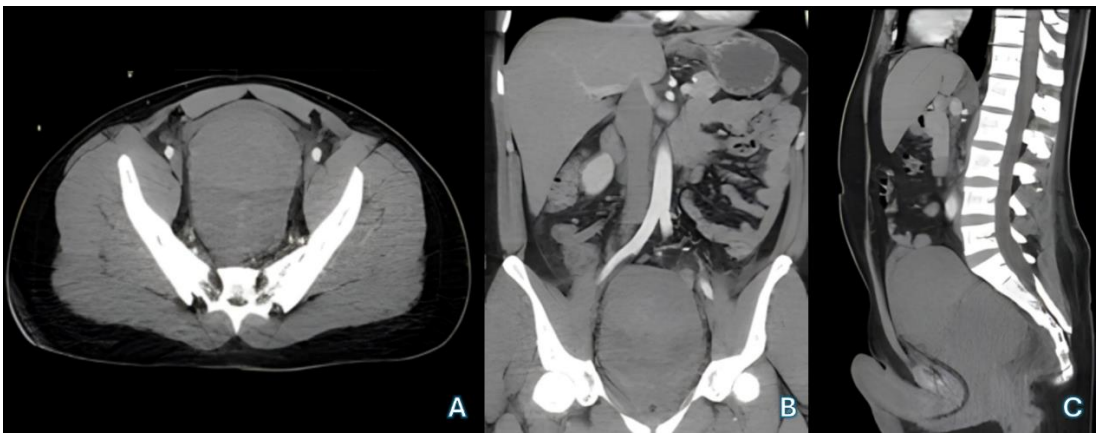

Figure 1: Abdominopelvic CT-scan.

Figure 1 legend: CT-scan in the late arterial phase in axial section reconstruction (A) and coronal and sagittal reconstructions (B and C) showing a large solid mass of density and

contrast behavior similar to muscle, located in the pelvic cavity, which conditions the volume effect on the adjacent structures, displacing the rectum anteriorly and laterally to the left, suggesting a retroperitoneal location.

Magnetic resonance imaging (MRI) using a 3 Tesla Siemens scanner with T1 fat-suppressed, contrast-enhanced T1, and T2 sequences in the axial, sagittal, and coronal planes confirmed the CT findings. The mass had intermediate T1 and low T2 signal intensities, with moderate gadolinium enhancement. It maintained clear interfaces with the bladder, prostate, seminal vesicles, and rectum. Anterolateral vascular structures and a central signal void, consistent with a feeding vessel, were also observed. The mass compressed the bladder anteriorly and displaced the rectum and sigmoid colon anterolaterally (Figure 2 and Figure 3).

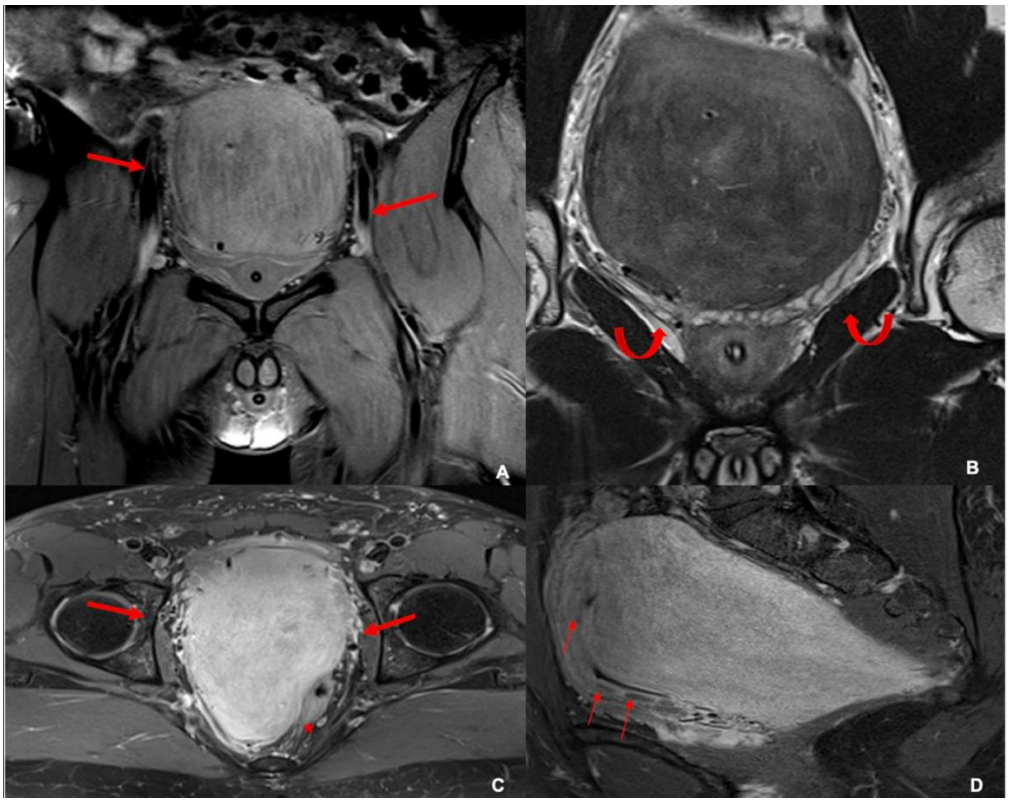

Figure 2: Abdominopelvic MRI.

Figure 2 legend: Coronal T1- and T2-weighted MRI images (A and B) and gadolinium-enhanced T1-weighted MRI images (C and D) showing a large, piriform retroperitoneal tumor occupying the pelvis. It has circumscribed margins and shows intermediate intensity on T1-weighted images, low intensity on T2-weighted images, and a moderate homogeneous enhancement after contrast. The lesion preserves the interfaces and compresses the bladder, prostate, and seminal vesicles (curved arrows in image B) in addition to displacing the rectum (asterisk) anteriorly and laterally. Semi-surrounding anterolateral vascular tracts (thick arrows in images A and C) and a central tubular tract with a signal void, corresponding to a feeding vessel (thin arrows in image D), were also identified.

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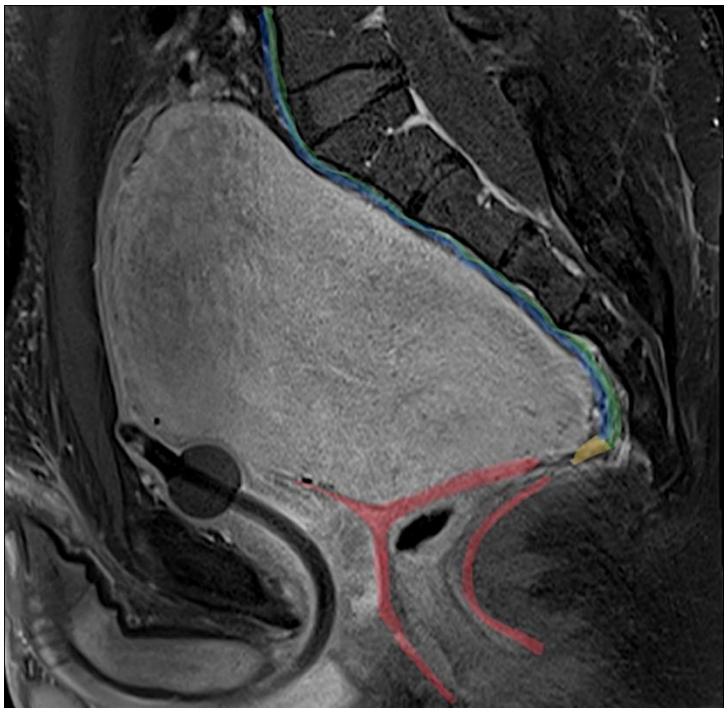

Figure 3: MRI sagittal plane.

Figure 3 legend: T1-weighted MRI with gadolinium in the sagittal plane, where the contour of the Denonvilliers' rectogenital fascia is marked in red, the parietal layer of the pelvic fascia in green, the visceral layer (or rectal fascia) of the pelvic fascia in blue, and the sacrorectal ligament in yellow.

US-guided biopsy using an 18G×20 cm TRUCUT needle and an automatic Bard Magnum system yielded eight tissue samples. Histopathological examination revealed a spindle cell neoplasm consistent with leiomyoma. After appropriate preoperative planning to prevent urological injury, a complete surgical excision was performed. The tumor appeared to originate from Denonvilliers' fascia. It caused anterolateral rectal displacement and bladder collapse, measuring approximately 15×10×9 cm. It had smooth borders, was firm but not calcified, and showed no invasion of the bladder, prostate, seminal vesicles, or rectum (Figure 4). Peritoneal drains were placed in the right pelvic and left retropubic spaces. Postoperative recovery was uneventful.

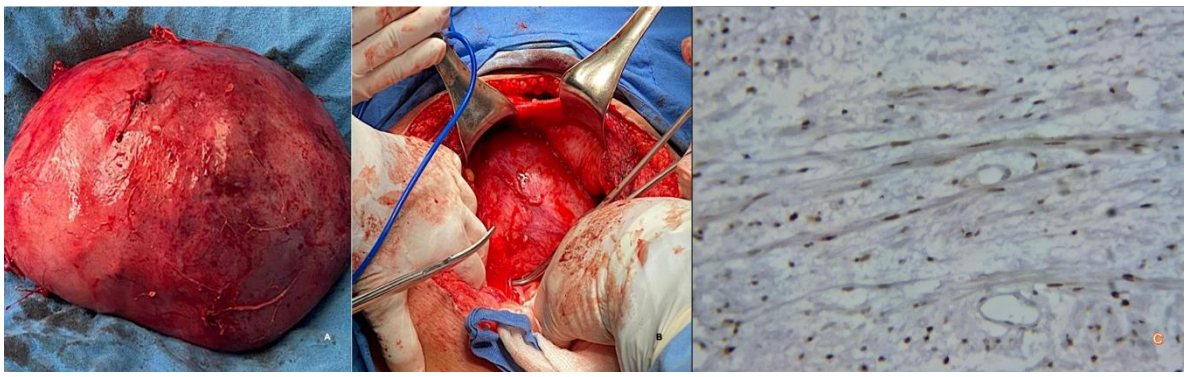

Figure 4: Macroscopic and microscopic images of abdominal leiomyoma.

Figure 4 legend: Macroscopic images of a postoperative (A) and intraoperative (B) retroperitoneal lesion, which is irregularly ovoid, measuring 20 × 15 cm, with a brown, rough external surface, and firm consistency when sectioned. Immunohistochemistry showing positivity for actin (C).

Histological sections revealed a neoplasm composed of uniform smooth muscle cells, arranged in a swirling pattern. These medium-sized cells, with indistinct membrane and cytoplasm, had an elongated nucleus with blunt edges, characteristic of a cigar. No atypia, mitoses, or necrosis was observed, which, in conjunction with routine staining, led to the conclusion that this was a conventional leiomyoma. A comprehensive immunohistochemical panel was performed to support the previously established morphological diagnosis, with immunohistochemical positivity for smooth muscle actin, h-caldesmon, and estrogen receptors, and a Ki67 index of 2% (Figure 4).

At six-month follow-up, contrast-enhanced CT revealed only postsurgical changes in the abdominal wall and mesorectal fascia without evidence of recurrence or metastasis.

DISCUSSION

Leiomyomas are common benign mesenchymal tumors that arise monoclonally from smooth muscle cells [4]. However, primary deep soft tissue leiomyomas that occur independently of visceral organs are exceptionally rare [5]. Most retroperitoneal smooth muscle tumors are malignant; thus, benign forms such as leiomyomas are exceedingly uncommon in this location [2].

Non-visceral leiomyomas are generally classified into somatic soft tissue or retroperitoneal/abdominal types. Somatic variants typically involve the extremities, particularly the thigh, while retroperitoneal leiomyomas are predominantly observed in women [3]. Their occurrence in males is exceedingly rare, and to date, no prior cases have been reported in individuals undergoing GAHT. Therefore, our case provides a novel perspective on the possible relationship between feminizing hormonal therapy and the development or progression of hormone-responsive mesenchymal tumors.

Although the precise pathogenesis of extrauterine leiomyomas remains unclear, ER and PR are widely considered to be central to their development. Paal and Miettinen reported that retroperitoneal leiomyomas frequently express ER and PR, suggesting a hormone-dependent origin, possibly from smooth muscle or Müllerian remnants [3]. This receptor profile is particularly relevant in patients with prolonged exposure to exogenous estrogen, such as those receiving GAHT.

Epperson et al. described a comparable case in which mammary myofibroblastoma developed in a transgender woman following 13 months of feminizing hormone therapy. The tumor's ER and PR positivity raised the hypothesis that exogenous estrogen may stimulate the development or growth of hormone-sensitive soft tissue tumors [6]. Although the histological subtypes differ, both cases share the underlying mechanism of hormone-stimulated mesenchymal proliferation, further supporting the plausibility of GAHT-related tumorigenesis beyond breast tissue.

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The expansile nature of the retroperitoneum and abdominal cavity permits these tumors to grow significantly before the clinical symptoms arise. When present, symptoms such as abdominal fullness or gastrointestinal disturbancestypically result from a mass effect on adjacent structures [7]. These nonspecific manifestations complicate timely diagnosis and underscore the importance of thorough preoperative imaging and laboratory evaluation.

Phillips et al. reported a case of a large abdominal leiomyoma in a 52-year-old cisgender male, emphasizing the diagnostic complexities associated with such masses and the role of immunohistochemistry (IHC) in ruling out malignancy [5]. Mahmood et al. documented an intraperitoneal pelvic leiomyoma in a male patient, further affirming the inclusion of leiomyomas in the differential diagnosis of abdominal tumors in men [8].

Initial assessment using US provides basic insights, primarily distinguishing solid from cystic structures, but lacks specificity for deep-seated retroperitoneal tumors [7]. CT plays a more definitive diagnostic role by clarifying the anatomical relationships and contrast behavior of the tumor. MRI, with superior tissue characterization, is particularly valuable when organ involvement is uncertain [9]. Although MRI effectively differentiates uterine leiomyomas from leiomyosarcomas, studies focusing specifically on retroperitoneal leiomyomas remain limited [10]. Key radiologic features suggesting a retroperitoneal origin include obtuse angles with adjacent structures, visible tissue planes, and anterior displacement of the rectum or cecum. A solid, well-defined, homogeneously enhancing mass with muscle-like attenuation generally indicates a benign or low-grade mesenchymal tumor [9, 11, 12]. Nonetheless, distinguishing between leiomyomas and low-grade leiomyosarcomas remains challenging because of overlapping imaging features [3]. Therefore, histopathological confirmation is essential [9, 11, 12].

In our case, the tumor was anatomically traced to Denonvilliers' fascia, a fibromuscular structure that separates the rectum from the bladder, prostate, and seminal vesicles. This anatomical detail has significant implications for surgical planning. Ferri et al. recently reaffirmed the embryologic dual origin of Denonvilliers' fascia and its critical role in urogenital surgery [13]. The presence of embryologically derived smooth muscle and mesenchymal tissue in this region may account for its susceptibility to hormonally responsive tumor development. Our case supports this hypothesis and highlights the fascia as a potential site for neoplasms in the context of GAHT.

Histologically, deep soft tissue leiomyomas are distinguished from leiomyosarcomas by the absence of cytological atypia, coagulative necrosis, and minimal mitotic activity (typically <1 mitosis per 50 high-power fields [HPF]). In retroperitoneal cases, up to five mitoses per 50 HPF may still be considered within benign limits [7].

Among the nine previously reported retroperitoneal leiomyomas, IHC was performed in seven cases: 100% were positive for smooth muscle actin (SMA) and desmin, 28% were ER-positive, and 42% were PR-positive [4]. Paal et al. confirmed that these tumors frequently mirror the histological and immunophenotypic characteristics of uterine leiomyomas, further supporting their hormonally responsive origin [3].

Although a definitive causal link between GAHT and mesenchymal tumor development remains speculative, emerging evidence supports a broader spectrum of systemic effects. Plamondon et al., in a large cohort, identified an increased risk of metabolic syndrome and systemic alterations in patients undergoing feminizing hormone therapy [14]. Although neoplastic transformation was not directly addressed, these findings underscore the importance of long-term monitoring in transgender patients receiving GAHT.

CONCLUSION

This case represents a rare intersection of retroperitoneal leiomyoma, hormone-responsive tumor biology, and sex-affirming hormone therapy. This raises important clinical considerations regarding the long-term implications of exogenous estrogen in mesenchymal tissues. Clinicians should be vigilant for atypical presentations of hormone-sensitive tumors in transgender patients. Further research is required to determine whether these observations indicate a broader trend or constitute an isolated event. Establishing surveillance protocols and conducting prospective studies will be crucial for assessing the oncologic safety profile of GAHT.

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Declarations

Conflict of interest: All the authors declare no conflicts of interest.

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