Submitted: 30 September, 2022 Accepted: 03 March, 2023 Published: 15 August, 2023 DOI:10.22514/ejgo.2023.052

ORIGINAL RESEARCH

European Journal of Gynaecological Oncology

The infrequent large pelvi-perineal tumors as a surgical dilemma: en bloc resection and long-term results

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Abstract

To assess long-term results of surgical resections of the sporadic extra-large pelvi-perineal soft tissue tumors, a retrospective series of patients referred to the National Cancer Institute 2001–2022 (tertiary care cancer university hospital in Egypt) was designed. Thirteen patients (3 males) averaged age 57 years had large 29 cm (18–38) pelvi-perineal tumors (10 to the paraanal ischiorectal spaces and 3 to the vulva) plus upper intra-abdominal extensions in 9 patients (69%). Symptoms were nonspecific with delayed presentation that averaged 22-month. The entire underwent combined open abdomino-perineal approach to widely en masse resect tumors plus infiltrated organs. No downsizing hormonal treatment was offered preoperative. Main outcome measures were disease free survival, recurrence pattern and salvage. Extensive pelvic and perineal tumor resection is tough and meticulous but straightforward with minor (Clavien-Dindo Classification (CDC) grade I & II) early and delayed morbidity. Resection extends to hysterectomy, vaginectomy and vascular resection. Histopathology plus immunohistochemistry showed 9-aggressive angiomyxoid tumors (AA), 2-fibromatosis and 2-neurofibromas (NF). Margins of resection are all adequate (R_0) except for 2 (Resection margin 1 (R_1)). After 50-month median follow up, 8/13 total series (61.5%) were surviving free of disease. 4/9 of AA (44%) had local perineal and/or pelvic recurrences (13–37 months) and all were amenable to curative salvage resections; while, 1/2 patients with fibromatosis died of disseminated peritoneal relapses. No systemic metastases are noticed. Extensive tumors meticulous surgery with experienced pelvic dissection and resection could offer alone long term cure even after recurrences with minor morbidity in a good percent. Fertility sparing resection is not oncologically safe because of the frequent uterine and ovarian invasions.

Keywords

Pelvic neoplasm; Pelvi-perineal tumor; Vulval tumor; Angiomyxoma; Pelvic fibromatosis; Pelvic neurofibroma

1. Introduction

These rare pelvi perineal tumors present a surgical challenge and most of the studies are case reports with no consensus regards surgical techniques and adjuvant treatment [1–3].

Aggressive angiomyxoid (AA) neoplasm is the most frequent histology and albeit non metastatic, 36–72% may relapse locally. Immunohistochemistry supported that tumor cells stem from mesenchymal cells with the features of fibroblasts and myofibroblasts with positive Cluster of Differentiation 34 (CD34), Smooth Muscle Actin (SMA), Estrogen receptor (ER), Progesterone receptor (PR) and vimentin. Other tumors; but hardly ever, may present similar clinical features as pelvic mucinous neurofibromas with less vascular component, low recurrence rate and +ve S-100 and fibromatosis (desmoid tumor) with −ve CD117 and +ve β-Catenin and high risk of local recurrence [1, 2].

Incidence in females is significantly 6-times higher compared to males and since the bulk of tumor is slowly growing and often hidden within the pelvis and perineal fat it does not lead to early rectal, bladder, vaginal or vascular compression symptoms and most tumors are large as observed at the time of resection [3–8].

This study evaluates the surgical care in a group of patients referred to our institute over 21 years.

2. Patients and methods

Since 2001 up to 2022, 13 consecutive patients (3 males) with pelvi perineal tumors were surgically treated at the National Cancer Institute, Cairo University following institutional review board approval. Median age was 57 (39–72) and their main presentations were urinary bladder and rectal compression symptoms beside pelvic fullness (Table 1). Presenta-

tion was delayed for 20 months (9–37). Palpable abdominal extension was evident in 9 patients (reaching up to 8–12 weeks above the pubic bone). Renal ultrasound monitored unilateral back pressure changes in 7 patients signifying lower ureteric compression (influencing ureteric stents); meanwhile, cystoscopy didn't find any mucosal bladder invasion or edema. Similarly, sigmoidoscopy and proctoscopy didn't reveal mucosal invasion.

Computerized tomography (CT) and/or Magnetic Resonance imaging (MRI) were the main localizing, diagnostic and metastatic work up procedure (Figs. 1,2). Working labs were within normal except for mild normocytic normochromic anemia in all ladies, mildly elevated Cancer antigen-125 (Ca-125) and normal levels for α-fetoprotein, beta-Human Chorionic Gonadotropin (β-HCG), Ca-72 & Human epididymis protein 4 (He-4).

Prior image guided pathologic diagnoses either transabdominal or perineal were available for 7-cases (spindle cell neoplasm with low mitosis). Other 6-patients had inappropriate perineal excision biopsy at the referring hospitals assuming reporting clinical diagnosis of lipoma, Bartholin's cyst or chronic infection. Desmoid tumors had neither family history of similar tumor (Gardner Syndrome) nor any associated colon polyposis.

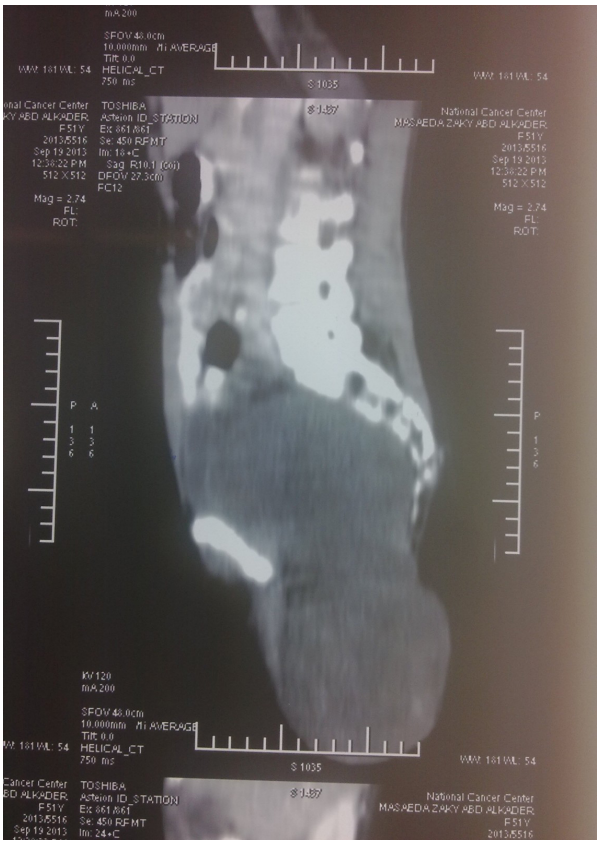

FIGURE 1. Helical CT of a 51 years' lady with pelvi perineal AA tumor and abdominal extension and lt. para anal perineal extension.

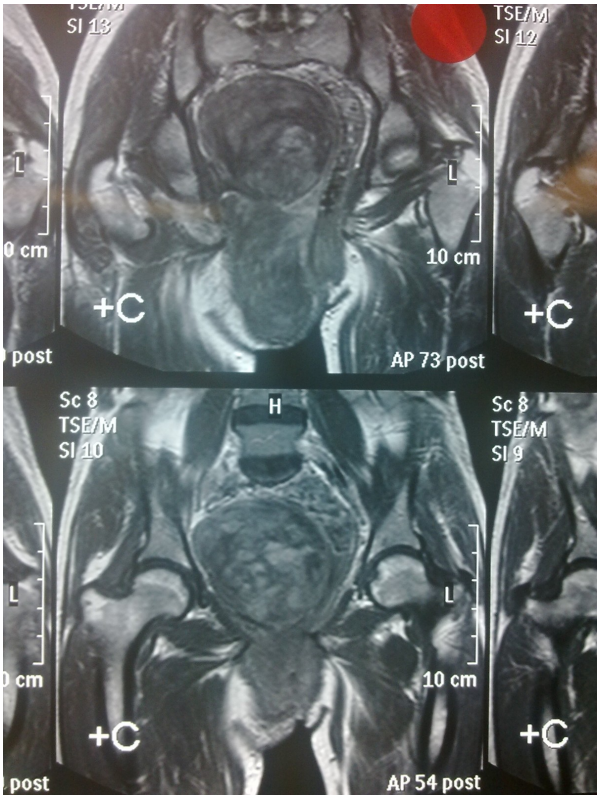

FIGURE 2. MRI of a 68 years' lady with AA tumor and rt. labial extension.

3. Technique

Surgery begins by abdominal phase to mobilize tumor adhesions away the bladder, ureters, rectosigmoid and secures vascular connections legating main stem internal iliac artery uni/bilaterally, according to tumor vascularity. Resection includes adherent pelvic organs in additional and dissection extends to the pelvic floor around tumor to reach the pelviperineal tunnel.

Perineal phase was performed in Lithotomy or lateral position dissecting the ischiorectal fossa, incising the pelvic floor muscle, releasing anorectal adhesions plus blunt tunnel mobilization to deliver the mass up through abdominal. (Figs. 3,4).

For vulval-labial extension, dissection starts with wide elliptical labial skin incision around the mass extending up to paravaginal plus ipsilateral ischiorectal spaces ± adherent vaginal wall resection with reconstruction at the same sitting by gracilis myocutaneous so described in previous vaginal reform reports [9].

Post-operative pelvic and perineal external beam irradiation was tried in only two patients with fibromatosis using 3300 cGy/4W [10].

Patients are sent home and put on regular follow-up 6-monthly with abdominal and pelvic MRI.

Data analysis applies SPSSwin statistical package version-12 (IBM, Armonk, NY, USA), numerical data as mean ± standard deviation (SD), median (minimum-maximum) and qualitative as frequency (%).

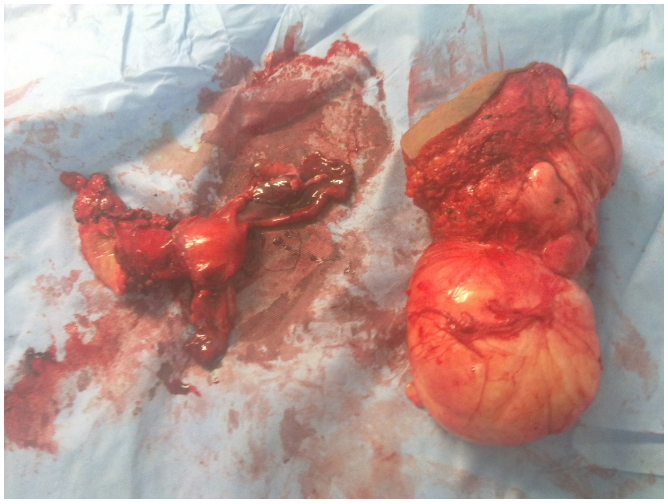

FIGURE 3. Operative specimens of 37 cm pelvi-perineal fibromatosis with resection of ischiorectal fat and perineal skin and separate associated total hysterectomy, bilateral tubo-ovarian resection and upper vaginal cuff.

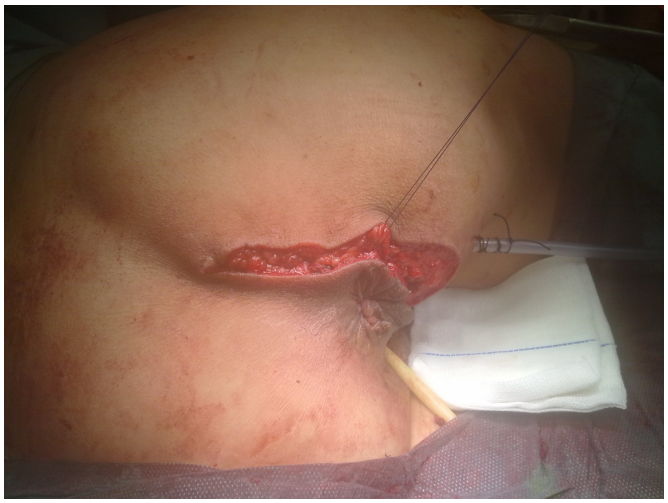

FIGURE 4. Perineal wound at the left ischiorectal fossa resecting overlying skin and fat with the tumor in close contact with the anorectal segment. Closure commences after mass dissection and delivering specimen up abdominally.

4. Results

Aggressive angiomyxoma is the histologic type in 9 patients (one male) with +ve CD34, SMA and vimentin, 2- NF (+ve S-100) and 2-fibromatosis with −ve CD117 and +ve β-Catenin. Desmoid tumors were not part of Gardner syndrome or colon polyposis syndrome.

Margins of resection are free for 11 operative specimens (R_0) and 2 have invasion (R_1). One male patient with fibromatosis invading right external iliac vessels had upper margin invasion and other lady with AA had posterior margin extension. Resected adherent organs are the uterus, tubes & ovaries in 10-ladies, Rt. external iliac vessels in a single male case, lateral lower vaginal wall in 2-patients, posterior bladder wall in a single situation and sigmoid colon segment for another patient. Ligature transfixions of ipsilateral internal iliac artery were mandatory for 6 and bilateral for other 2-cases to control extensive parasitic neovascular adhesions. Collectively tumor infiltrations are, 4/10 (40%) of hysterectomies, 3/10 (30%) of overiectomies and 2/2 of vaginectomy. Bladder and colon segments are superficially infiltrated besides artery encasement rather than actual invasion. No lymphovascular or node invasions appeared in the resected specimens.

Mean operative time occupied was 185 minute (147–380) and blood loss averaged 550 $\pm$ 460 mL with 3 (2–6) transfuse units. In-patient stays were 5 days (3–17); with minor CDC grade I & II abdominal wound sepsis in 3 patients [9].

After a median follow up of 50 months (19–101), 5 patients (38.5%) including 2 males developed local pelvic and perineal recurrences (4 AA & 1 fibromatosis) without systemic metastasis. One male with R_1 fibromatosis developed pelvic and perineal recurrence 8-month post-surgery. Open resurgery removed recurrences and patient survived 11-month free. Later on; he died of multiple unresectable abdominal and pelvic peritoneal recurrences, bilateral hydronephrosis and intestinal obstruction.

Four out of nine AA tumors (44%) had multiple recurrences in the perineal scar and pelvis 13, 16 & 27 months post primary surgery. Wide perineal resection for two and pelvic tumor resection together with partial cystectomy and segmental rectal resection for another two were effective to control later recurrences. One AA male patient (serial 8 in Table 1) had 5 cm perineal recurrence excision 13-month. Post original surgery, 7-month later he had 2nd 6-cm pelvic recurrence excision and 12-month afterward 3rd 2 cm perineal scar reexcision.

All AA recurrences have the same histopathology with some mitotic figures and all resected organs were superficially invaded.

Three mortalities were observed (2-tumor specific and one acute ischemic heart infarction).

5. Discussion

Most pelvic tumors originate from the organs. Less commonly, tumors can arise from the various anatomic pelvic compartments and are comprised of mesenchymal tissue: muscles, connective tissue, vessels, lymphatics, and fat. Among some of the rarer entities are benign tumors (angiomyxoma, cellular angiofibroma, and desmoid fibromatosis), sarcoma and tumors that can manifest as benign or malignant (solitary fibrous tumor or nerve sheath tumor). Because these tumors are uncommon and often manifest with nonspecific clinical features, imaging (usually MRI) is an initial step in the evaluation [11].

Since these tumors are gradually growing deeply seated, it is difficult to detect them early and pathological examination revealed that the maximum diameter ranged up to 60 cm, mostly $\geq$20 cm. Tumors are commonly partially or non capsulated taking the shape of elongated, dumbbell or irregular large mass. Most tumors are lobular, heterogeneous in consistency with unclear invasive borders. They usually adhere to muscles, fat and nearby organs by dissectible fibrovascular tissues [2–6].

TABLE 1. Pelvi perineal tumors: clinicopathological features & follow-up.

	Sex (age)	Clinical Tumor extent (Delay period)	Tumor (size)	Infiltrate	Rec. site (free period)	2nd surgery	Life	Follow-up period
1	Female (59 yr)	Abd + Lt para anal (37 mon)	AA (35 cm)	-	Perineal (16 mon)	2 times	free	58 mon
2	Female (39 yr)	Abd + Rt para anal (22 mon)	AA (22 cm)	Ova sigmoid	-	-	free	101 mon
3	Female (46 yr)	Abd + Lt para anal (19 mon)	AA (32 cm)	Ut + Ova Bladder	Pelvic (27 mon)	2 times	dead	51 mon
4	Female (43 yr)	Abd + Lt para anal (10 mon)	AA (28 cm)	Ut + Ova	-	-	free	43 mon
5	Female (68 yr)	Rt. Labia (9 mon)	AA (26 cm)	vagina	-	-	free	26 mon
6	Male (71 yr)	Abd + Rt. para anal (30 mon)	Fibro (32 cm)	Iliac artery	Pelvic + Peritoneal (8 mon)	1 time	dead	19 mon
7	Female (72 yr)	Abd + Lt. labia (11 mon)	AA (30 cm)	vagina	-	-	free	44 mon
8	Male (65 yr)	Abd + Post anal (9 mon)	AA (38 cm)	-	Perineal + Pelvic (13 mon)	3 times	free	67 mon
9	Female (50 yr)	Abd + Rt. Labia (20 mon)	NF (31 cm)	-	-	-	free	64 mon
10	Female (61 yr)	Rt. para anal (10 mon)	AA (26 cm)	Ut	-	-	free	52 mon
11	Female (51 yr)	Abd + Rt. para anal (11 mon)	Fibro (37 cm)	-	-	-	free	55 mon
12	Male (61 yr)	Rt. para anal (12 mon)	NF (18 cm)	-	-	-	free	47 mon
13	Female (60 yr)	Lt. para anal (20 mon)	AA (19 cm)	Ut	Perineal (16 mon)	1 time	dead	25 mon

Tumor extension: Abd (abdominal), para anal (para anal perineal extension); Histopathology: AA (aggressive angiomyxoma), Fibro (fibromatosis), NF (neurofibroma); Confirmed infiltrated organ: Ut (uterus), Ova (ovary); Rec (local recurrence site), free period (disease free period).

AA is locally aggressive because of local invasiveness plus recurrence and requires wide removal with firmly adherent organs, tissues and underlying perineal skin to get negative margins. 85% of relapses appear within 5 years and 2-month is the earliest reported recurrence time whereas the latest reported was 20 years. Pelvic desmoids (fibromatosis) is more invasive and highly recurrent. Neurofibromas on the contrary; although reaches huge size, have more innocent behavior with low risk of recurrence [11, 12].

Present series; although with limited cases gives description of possible treatment method for these tough massive tumors with acceptable cure rate. Through preoperative assessment and meticulous operative technique with sufficient pelvic surgery experience are essential due to limited pelvic spaces and disturbed anatomy. AA local recurrence is delayed but amenable for reexcision with cure but pelvic fibromatosis is aggressive with short disease free period. The infrequent large pelvic neurofibromas are safe to resect without apparent recurrence over long observation time.

These tumors have low mitotic activity excluding radiation or systemic chemotherapy to be appropriate adjuvant treatment options. Some studies suggested that AA tumors are hormone dependent because of +ve ER & PR in most patients and advised gonadotropin releasing hormone agonist (GnRH-α), aromatase inhibitors or ant estrogen drugs as neoadjuvant shrinking treatment before surgery [13–15]. In a retrospective multicenter study on 13 advanced AA, first line GnRH-α treatments lead to overall response rate of 62% and progression-free survival of 24.6 months. Combining with aromatase inhibitors resulted in response in two non-responders and authors suggested the combined regimens with surgery [16].

Unluckily, hormone receptors were not available in our group of AA because of infrequency of cases in spite of use of other immunohistochemical markers for precise histologic diagnosis and no pre or post-operative hormonal or radiation treatment was advocated except for 2 cases with fibromatosis with unclear results.

Limited patient's number makes difficulty to consider significant clinicopathologic prognostic factor that affects tumor recurrence risk. Involved surgical margins (R_1) recurred and eventually died; however, three other R_0 patients recurred. Age and sex effects can't be considered because of different tumor histology and similarly extra tumor tissue infiltration.

6. Conclusions

This consecutive series evaluated clinical, pathologic and natural history of the infrequent pelvic soft tissue tumors extending to the perineum. Surgery is the mainstay modality for these infrequent neoplasms with acceptable cure and morbidity rates, even for recurrent tumors. Fertility preserving in young patients and minimal invasive surgery in the face of huge pelvic and highly recurrent tumors are questionable.

AVAILABILITY OF DATA AND MATERIALS

The original series characteristic data within this article including figures are available on reasonable authorized request from the corresponding author.

AUTHOR CONTRIBUTIONS

OAHN—designed the research study, performed the research, collected follow up data and analyzed them; responsible for the wright and read of this manuscript and decision to submit the final one for publication.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This research was approved by the Surgical Oncology department at the National Cancer Institute, Cairo University as an Ethical Institutional Review Board. Patients provided informed consent and agreed to publication of the details of this research.

ACKNOWLEDGMENT

The author would like to thank Team of the Surgical Oncology Unit, National Cancer Institute, Cairo University.

FUNDING

This research received no external funding.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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How to cite this article: Omaya Abdul Hameed Nassar. The infrequent large pelvi-perineal tumors as a surgical dilemma: en bloc resection and long-term results. European Journal of Gynaecological Oncology. 2023; 44(4): 22-27. doi: 10.22514/ejgo.2023.052.