

EVALUATION OF THE EFFICACY OF THE POSTERIOR MIDSAGITTAL APPROACH FOR SURGICAL RESECTION OF LOW-SITED INTRAPELVIC TUMORS: A PROSPECTIVE CLINICAL TRIAL.

By

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Background: Low-sited presacral intrapelvic malignant tumors represent one of the challenging situations for surgeons. Laparotomy alone often does not provide adequate exposure for complete excision of a midline intrapelvic tumor.

Objective: To evaluate, describe and discuss the use of PMA in the treatment of intrapelvic malignant tumors which are too high to be approached through the perineum and too low to be excised by laparotomy alone.

Patients: A prospective study of eighteen patients suffering from documented malignant low-sited intrapelvic tumors.

Methods: All patients were subjected to tumor excision through the posterior midsagittal approach. After excision, the rectum was placed in the normal position. The pelvic floor muscles were reconstructed in the midline.

Results: The size of the completely resected tumors ranged from 2.5 x 4 cm to 7 x 11.5 cm. Complete excision was amenable in 15 patients (83.33%), while in three patients only partial tumor excision could be done. Histopathological results of resected tumors showed the predominance of prostatic rhabdomyosarcoma in male patients and mature teratoma in female patients. Postoperatively, no complications were recorded. In all the nine patients above 4 years-old, fecal continence was not affected. The function of the bladder remained undisturbed in all patients. Postoperative follow up of patients revealed that patients with complete tumor excision (83.33%) were disease-free during the whole follow-up period, (mean of 24.5 ± 5.33 months).

Conclusion: Based on the results of this study, it can be concluded that PMA is a safe effective procedure for the radical excision of Intrapelvic malignant tumors which are too low to be approached through the perineum and too high to be reached by laparotomy alone

Keywords: Posterior sagittal approach, intrapelvic tumors.

INTRODUCTION

Low-sited presacral intrapelvic malignant tumors represent one of the challenging situations for surgeons. Laparotomy alone often does not provide adequate exposure for complete excision of a midline intrapelvic tumor. There are many reports in the literature of incomplete excision.⁽¹⁾ Incomplete resection of the intrapelvic tumours is associated with many complications that affect the future life of patients.⁽²⁾ The posterior midsagittal approach (PMA), originally used for the treatment of anorectal malformations, provides a wide exposure of the pelvic floor.⁽³⁾ Recently, the posterior sagittal approach has been introduced for the treatment of intrapelvic lesions with encouraging results.^(3,4) This study was designed to evaluate, describe and discuss the use of

PMA in the treatment of intrapelvic malignant tumors which are too high to be approached through the perineum and too low to be excised by laparotomy alone.

PATIENTS AND METHODS

A prospective study of eighteen patients suffering from documented malignant low-sited intrapelvic tumors admitted, in the period from January 2000 to January 2004, to the Unit of Pediatric Surgery (nine patients), to the Unit of Colon and Rectal Surgery (five patients): Alexandria Main University Hospital, and to the Department of Surgery: Medical Research Institute (four patients).

An informed consent was obtained from each patient's parents. The study protocol was registered and approved

by the committee of Postgraduate Studies and Medical Research, Faculty of Medicine, University of Alexandria. Patients with advanced disease or previous history of surgical intervention were excluded from the study.

All patients of this study (two infants, eleven children and five adults with intrapelvic neoplasms) were subjected to the following:

1. *Thorough clinical evaluation:* Full clinical history and complete systemic examination with special stress on pelvis and abdomen.
2. *Routine laboratory investigations.*
3. *Preoperative radiological evaluation:* Plain x-ray chest, abdomen and pelvis. Pelvi-abdominal ultrasound scanning. C.T abdomen and pelvis, (Fig. 1). M.R.I was done in some cases.
4. *Preoperative preparation:* General anesthesia with endotracheal intubation. A urethral catheter is placed. Patients are positioned in the Jack-knife position with a pillow under the groin, and another smaller one beneath the chest.
5. *Operative procedures:* A posterior midsagittal incision is done, extending from the midsacrum point down to the anal border. A bougie is inserted transanally. All striated muscle complex are divided in the midline, and the rectum is dissected in the midline under the guidance of an electrostimulator, the levator muscle is divided in the midline. A sling is placed around the rectum permitting its lateral traction. The wound is extended upwards, if necessary, by removing the tip of the coccyx. The tumor is first separated from the sacrum by creating a plane between the mass and the periosteum. Formation of this plane enables gradual dissection of the mass from the adjacent tissues. The neoplasm is then fully exposed, and careful dissection is carried out to completely remove the mass without harming the rectum (Fig. 2, 3). Preservation of the anatomical integrity of the pelvic floor structures is safeguarded by keeping the dissection close to the anatomical borders of the tumor. Care must be taken to control bleeding mainly from the middle sacral artery. After excision, the perirectal sling is removed and the rectum is placed in the normal position. The pelvic floor muscles are reconstructed in the midline. The wound is closed and a suction drain is left.
6. *Postoperative management:* Immediate

postoperative management emphasizes the immediate postoperative care of the patient, wound care and record of any postoperative morbidity.

- a. *Postoperative ultrasonographic study:* was repeated one month, six months and one year after operation.
 - b. *Postoperative CT/MRI evaluation:* after one month then every three months during the first year then every six months afterwards to assess for any recurrence.
7. *Follow-up:* Prospective follow up recorded the efficacy of complete tumor excision, the clinical and the functional outcome. All patients were followed up for a period that ranged from 12 months to 37 months with a mean of 24.5 ± 5.33 months, the patients were followed-up at one month then every three months till one year, then every six months afterwards. In each follow-up visit, patients were checked for recurrence of symptoms and continence, with thorough pelvic and abdominal examination.

RESULTS

Out of the 18 patients of this study, twelve patients were females, and six were males. The age distribution is shown in Table I. The clinical symptoms included constipation, fecal impaction, change in stool caliber, urine retention, voiding difficulties, abdominal distension, vomiting, and weight loss (Table II). Urine and stool retention were the main presenting symptoms, (88.88%), while only one case presented with abdominal distention due to extrapelvic extension of intrapelvic teratoma and another one case with weight loss.

Postoperatively, no complications were recorded. Abdominal distension resolved in those cases with initial presentation of abdominal distension, constipation and fecal impaction. In all the nine patients above 4 years-old, fecal continence was not affected. The function of the bladder remained undisturbed in all patients. Neither macroscopic infiltration into the surrounding tissues was detected nor tumor spilling occur during the operation in the completely resected cases with no involvement of the surrounding tissues was found on histopathological examination. Chemotherapy and/or radiotherapy were administered to all patients by the specialists according to the standard protocols.

Postoperative follow up of patients revealed that patients with complete tumor excision (83.33%) were disease-free during the whole follow-up period, (mean of

24.5 ± 5.33 months). Postoperative follow-up CT scanning revealed residual masses only in the three patients, in whom only partial resection could be carried out. Complete

resolution was noted in all the remaining 15 patients (Fig 4).

Table I: Age distribution in the studied patients.

<i>Age</i>	<i>Number</i>	<i>Percentage</i>
Up to 8 months	2	11.11
8 months - 2 years	4	22.22
2 years - 4 years	3	16.67
4 years - 6 years	4	22.22
14 years - 20 years	5	27.78
Total	18	100%

Table II: The main clinical presentation in the studied patients.

<i>Clinical presentation</i>	<i>Number</i>	<i>Percentage</i>
Vomiting with abdominal distension	1	5.56
Urine retention & voiding difficulty	7	38.88
Constipation with change of stool caliber	9	50.00
Weight loss	1	5.56
Total	18	100%

Table III: The histopathological results of the resected tumors.

<i>Histopathology</i>	<i>Number</i>	<i>Percentage</i>
Prostatic rhabdomyosarcoma	4	22.22
Presacral mature teratoma	5	27.78
Pelvic neuroblastoma	2	11.11
Pelvic ganglioneuroma	3	16.67
Presacral sarcoma	2	11.11
pelvic teratoma (Immature)	2	11.11
Total	18	100%

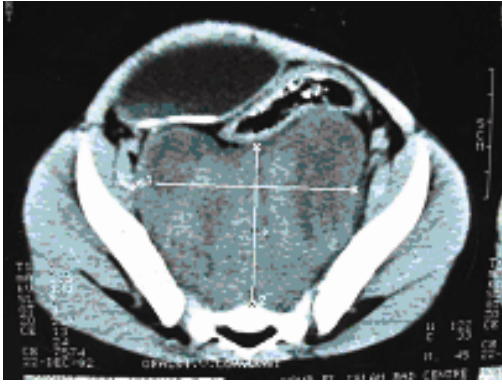


Figure 1: CT scanning shows a huge intrapelvic mass pushing the bladder and rectum anteriorly.

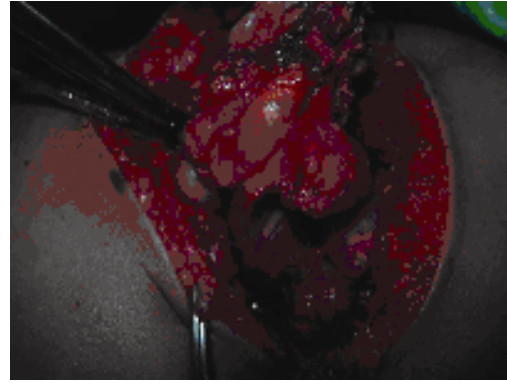


Figure 2: PSA exposing the tumour.

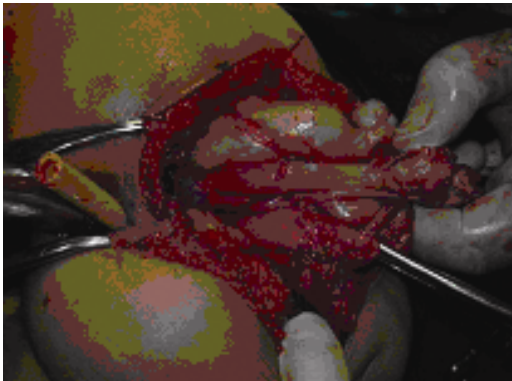


Figure 3: Tumor excision through PSA.



Figure 4: CT pelvis shows complete resolution of the tumor.

DISCUSSION

Since the early 1980's when Peña and De Vries⁽⁵⁾ advocated the posterior sagittal approach for the management of anorectal malformations; many authors reported its applicability in other indications; in repair of posttraumatic urethral stenosis,⁽⁶⁾ congenital H-shaped recto-vestibular fistula,^(7,8) posttraumatic and post-radiation fistulas,^(9,5) presacral masses,^(10, 11) complications associated with surgery of Hirschsprung's disease,⁽⁵⁾ urogenital sinus,⁽¹²⁾ anterior sacral meningocele,⁽¹³⁾ high vaginal strictures,⁽⁹⁾ Mullerian duct remnants^(14, 15, 16) excision of the presacral teratoma in an adult⁽¹⁾ and finally, in intrapelvic neoplasms excision.^(1,4,8)

Laparotomy alone is inefficient in approaching the intrapelvic tumors. It does not provide adequate exposure for complete excision of a midline intrapelvic tumor, thus incomplete excision with increased morbidity will be the end-result. Yamataka et al⁽⁸⁾ described a successful excision of pelvic neuroblastoma by combining the abdominal and PSA. In this study, PMA provided a better exposure, and allowed for complete excision of tumors except for those three cases where complete excision could not be done due

to marked infiltration of the rectum or the presence of undue adhesions with the sacrum that rendered the complete excision very difficult.

Keramidas et al⁽¹⁾ reported in a recent study that even partial excision of presacral neural crest tumor, presacral sarcoma, and Ewing sarcoma, were impossible by laparotomy. They reported that the tumors in these three cases were totally excised by PMA as an alternative procedure during the same surgical session. Furthermore, they reported a case with rhabdomyosarcoma of the prostate that had a history of one previous unsuccessful operation for excision of the tumor by laparotomy and that excision was accomplished by PMA during a second session.

Posterior Midsagittal Anorectoplasty (PMARA) has been used as the treatment of choice for anorectal malformations during the last twenty years.^(5, 17) Increasing experience with PMARA resulted in experience and expansion of the PMA use in the surgery of the pelvic floor lesions including tumors.⁽¹²⁻¹⁵⁾

Surgery of the pelvic floor lesions by PMA is

performed either transanorectally or with sparing of the integrity of the rectum by lateral traction. Our previous experience with from the excision of congenital malformations by lateral traction of the rectum helped us much to excise the Intrapelvic tumors, thus sparing our patients the necessity of a colostomy.

Fecal continence can be easily preserved by keeping the posterior incision strict to the midline, and repairing the muscle complex properly around the rectum after excising the tumour. Keramidas et al⁽¹⁾ reported similar results concerning the fecal continence.

CONCLUSION

1. PMA is a safe effective procedure for the radical excision of Intrapelvic malignant tumors which are too low to be approached through the perineum and too high to be reached by laparotomy alone.
2. The PSA offers a wide exposure, a much better and an easy access to the tumors arising in the intrapelvis as well as the presacral region, without disturbance of the sphincteric function.
3. Such access cannot be provided by other approaches without increased morbidity, with less resection capabilities.
4. Preservation of the anatomy of pelvic floor muscles prevents any affection of fecal continence.
5. Last but not least, reduction of postoperative hospital stay adds to its advantages.
6. Therefore, we recommend the use of PSA in the management of all low-sited intrapelvic masses due to its advantages.

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