

# Excision of Postchemotherapy Residual Retroperitoneal Mass in Testicular Cancer

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## ABSTRACT

In this study, patients, who underwent excision of retroperitoneal mass following chemotherapy for testicular cancers from 2006 to 2016, were studied and followed till 2021. The clinical and oncological outcomes were measured. Among 338 patients, who were treated for TC during the entire study period, 38 (11.2%) underwent excision of the residual retroperitoneal mass. The mean age of these patients was  $26.9 \pm 6.3$  years. The majority were stage 3 testicular cancer. Complete resection with negative microscopic margins was achieved in the majority of cases *i.e.* 31 (81.6%). Damage to the collateral structures was seen in 12 (31.6%) cases. On histopathological examination, teratoma was seen in 18 (47.4%) of the cases followed by necrosis in 10 (26.3%). Complications were recorded in 12 (31.5%) cases, most were low grades. At five years of follow-up, 19 (50%) were disease-free, 25 (65.8%) were alive, and 9 (23.6%) were lost to follow-up. Five-year survival rates are lower than standard template-based retroperitoneal dissection, however, complications rates are comparable. Such complex surgeries should only be performed in high-volume centres.

**Key Words:** *Testicular neoplasms, Lymph node excision, Seminoma, Germ cell and embryonal.*

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Testicular cancers are one of the most common solid organ malignancies that affect the young male population (15 to 30 years). The incidence rates are increasing worldwide and have almost doubled over the last 40 years.<sup>1</sup>

Some of the established environmental and genetic risk factors for developing testicular cancer includes cryptorchidism, previous personal history of testicular cancer, family history, and infections. Histologically primary testicular neoplasms are of three types namely; germ cell, sex cord-stroma, and extra-gonadal tumours. The germ cell tumours are further classified into two broad classes *i.e.* seminomas and non-seminomas.

The management following initial radical orchiectomy depends upon the clinical stage and histopathology of the primary disease. Treatment options include surveillance, chemotherapy, radiotherapy, and retroperitoneal lymph node dissection (RPLND). With cure rates reaching up to 100% in stage I disease and 80% in metastatic disease, it is often considered a model of curable cancer.<sup>2</sup>

RPLND is considered as a mainstay treatment for residual abdominal lymph node metastasis following chemotherapy (pc-RPLND). There is no available imaging that can reliably differentiate between the histology of such lesions therefore, their removal and histological examination remain the only option. The procedure involves the removal of all the visible and non-visible lymph nodes in the retroperitoneum that are the draining site of the ipsilateral testis. A template is used to achieve the complete removal of all the nodes. However, some authors have promoted the removal of only visible diseases without the removal of non-enlarged lymph node chains. This approach is known by different names such as limited resection of the retroperitoneal mass, excision of retroperitoneal mass, and lumpectomy. The reported outcomes of the two approaches are comparable in different series.<sup>3</sup>

The aim of this study was to analyse the oncological outcomes and surgical complication rates in the patients undergoing excision of retroperitoneal mass at a centre in Karachi, Pakistan.

This is a retrospective case review carried out at the Sindh Institute of Urology and Transplantation. It includes the patients who underwent excision of retroperitoneal mass following chemotherapy for testicular cancers from 2006 to 2016 and followed till 2021. Patients, with diagnoses other than testicular cancer, were excluded. Data were collected from the hospital records using pre-formed Performa. The variables such as age, symptoms on presentation, signs of disease, side of the disease, stage of the tumour, chemotherapy regimen, and response to chemotherapy were collected.

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**Table I: Descriptive statistics.**

Variables	n = 38
Age (years)	26.9 ± 6.3
Presenting symptoms	
Pain	23 (60.5%)
Swelling	22 (57.9%)
Testicular	15 (68.2%)
Abdominal	02 (9.1%)
Lymph nodes	05 (22.7%)
Hemoptysis	02 (5.3%)
Incidental	02 (5.3%)
Risk factors	
Cryptorchidism	05 (13.2%)
Family history	01 (2.6%)
Personal history	01 (2.6%)
Site of tumor	
Right	17 (44.7%)
Left	16 (42.1%)
Not available	05 (13.2%)
Clinical stage	
Stage 1	0
Stage 2	0
Stage 3	38 (100%)
Stage 3a	25 (65.8%)
Stage 3b	08 (21.1%)
Stage 3c	05 (13.2%)
Stage 4	0
Chemotherapy	
BEP	27 (71.0 %)
EP	05 (13.1 %)
TIP	02 (5.2 %)
VIP	3 (7.8%)
Operative time (min)	193.75 ± 65.9
Estimated blood loss (ml)	500, IQR 80
Hospital stay (days)	6.7 ± 3.9
Preoperative stenting	
Yes	02 (5.3%)
No	36 (94.7%)
Resection status	
R0	31 (81.6%)
R1	01 (2.6%)
R2	06 (15.85)
Intra-operative collateral damage	12 (31.6%)
Aortic repair	1 (2.6%)
IVC repair	3 (7.9%)
Bowel repair	2 (5.3%)
Bladder repair	1 (2.6%)
Nephrectomy	3 (7.95)
Tube thoracostomy	1 (2.6%)
Pack placement	1 (2.6%)
Clavin-Dindo complications grade	
Grade 1	12 (31.5%)
Grade 2	01 (8.3%)
Grade 3a	09 (75%)
Grade 3b	01 (8.3%)
Grade 4	01 (8.3%)
Grade 5	0
Oncological outcomes (at 5 years)	
Disease-free	19 (50.0%)
Recurrence	02 (5.2%)
Death	04 (10.5%)
Lost to follow-up	09 (23.6%)
Residual mass	04 (10.5%)
Biopsy of resected specimen	
MGCT	02 (5.3%)
Necrosis	10 (26.3%)
Seminoma	02 (5.3%)
Teratoma	18 (47.4%)
Yolk sac tumor	01 (2.6%)
Not available	05 (13.5%)
Survival at 5 year	25 (65.8%)

The surgical outcomes included operative time, blood loss, hospital stay, Clavin-Dindo grade of postoperative complication, and pathology of the resected specimen. The oncological outcomes were also recorded including recurrence and survival at five years of follow-up *i.e.* till 2021.

The data analysis was performed using SPSS version 20 (SPSS: An IBM Company, IBM Corporation, Armonk, NY, USA). The categorical variables were represented as counts and percentages while continuous variables as mean, median, and standard deviation.

A total of 338 patients were treated for testicular cancer during the entire study period, among them, 38 (11.2%) underwent excision of the residual retroperitoneal mass. The mean age of these patients was 26.9 ± 6.3 years. Pain and swelling were found to be the predominant modes of presentation *i.e.* 60.5 and 57.9 %, respectively. A history of cryptorchidism was found in 5 patients *i.e.* 1.4 % of all the patients visited for testicular cancers during the study period. There was an approximately equal distribution of sides of the involved testis.

The majority of the patients were classified into stage 3 testicular cancer, and therefore received chemotherapy. The BEP (Bleomycin, etoposide, and cisplatin) was the most commonly used regimen *i.e.* 71.0% followed by EP (etoposide and cisplatin) at 13.1% (Table I).

Complete resection with negative microscopic margins was achieved in the majority of cases *i.e.* 31 (81.6%). Damage to the collateral structures was seen in 12 (31.6 %) cases including vascular, bowel, and renal injuries that were managed during the surgery. On histopathological examination of the resected specimen, teratoma was the most frequent finding seen in 18 (47.4%) of cases followed by necrosis in 10 (26.3%). Complications were recorded in 12 (31.5%) cases, most of them were low grades on the Clavin-Dindo grade of postoperative complications. At five years of follow-up, 19 (50%) were disease-free, 25 (65.8%) were alive and 9 (23.6%) lost to follow-up (Table I).

Testicular cancer is the commonest solid organ malignancy of young adolescent males with overall good and disease-free survival following the treatment with chemotherapy and surgery.<sup>4</sup> In this study, we have presented data from a single high-volume uro-oncological centre.

The mean age of the study population was 26.9 ± 6.3 years which is comparable to the regional and international studies. The mean age of the patients with non-seminomatous tumours were younger *i.e.* 25.05 years compared to those with seminomatous tumours *i.e.* 33.0 years.

Pain and swelling were the common modes of the presentation *i.e.* 60.5 and 57.9%, respectively. Among the patients who presented with swelling, 31.8% had abdominal or lymph node swellings indicating an advanced stage of disease. The number of the patients identified at an asymptomatic stage with the routine clinical examination or self-examination was negligible.

This relates to a higher stage of presentation in this study population.

Among the entire population of the patients with testicular cancer treated during the study period (338), a history of cryptorchidism was recorded in 5 patients (1.4%), family history of testicular cancer in 1 (0.29%), and personal history of testicular cancer in 1 (0.29%). These values are lower than reported in the literature and are probably caused by the retrospective nature of data where some information is often missed.

The standard chemotherapy regimen was BEP (Bleomycin, etoposide, and cisplatin) followed by EP (etoposide and cisplatin).<sup>5</sup> The details of chemotherapy cycles and their complications were not recorded in this study.

The median operative time of excision of the retroperitoneal mass was 167.5 minutes compared to an operative time of 185 (IQR 150-240) minutes for unilateral and 300 (IQR 214-405) minutes for bilateral retroperitoneal lymph node dissection. An estimated blood loss of 500 (IQR 80) ml was recorded that was comparable to the other studies *i.e.* 300-700 ml. This entails that the perioperative parameters of the two approaches are comparable.<sup>6</sup>

Damage to the collateral structures was recorded in 12 (31.5%) cases including vascular, bowel, bladder, and renal injuries. Several factors are responsible for these injuries such as invasion by tumour, surgical technique, and postchemotherapy fibrosis. There are variations in the literature on the reported incidence of injury to surrounding organs. Vascular injuries were reported to be 8.6% by Heidenreich *et al.* compared to 10.4% in the provided data.<sup>5</sup> An injury to the bowel was also reported in 6.4% to 7.9% of cases in the different series cited above.<sup>5</sup>

Considering the invasiveness of the surgery, high complications are expected. In this analysis, postoperative complications were recorded in 12 (31.5%) cases and most of them were low grades 10 (83.3%) on Clavin-dindo grading. These results are equivalent to the published data in the other studies.<sup>4</sup> About half of the patients *i.e.* 19 (50%) were disease-free at five years of follow-up and 25 (65.8%) were alive, however, 9 (23.6%) lost to follow-up.

There were some limitations to this study including a retrospective nature of data and a significant proportion of patients who lost to follow-up.

Excision of postchemotherapy residual retroperitoneal mass is a challenging and morbid surgical procedure. Survival rates at

five years are lower than standard template-based retroperitoneal dissection, however, complications rates are comparable. Such complex surgeries should only be performed in high-volume centres.

#### DISCLOSURE:

This study is part of a thesis.

#### COMPETING INTEREST:

The authors declared no competing interest.

#### AUTHORS' CONTRIBUTION:

MN, MH, PK: Conception of design, data collection, analysis, and manuscript writing.

RM: Data collection and analysis.

GS: Revision of the manuscript and critical appraisal.

AH: Final approval of the version to be published.

All the authors have approved the final version of the manuscript to be published.

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