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Original Research Article

Retrospective analysis of patients undergoing retroperitoneal lymph node dissection for carcinoma ovary comparing CT and histopathology: a single centre study

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ABSTRACT

Background: Ovarian cancer accounts for a large portion of female genital cancer and most are now detected in early stages. Importance is now placed on less radical surgeries and the exact role of RPLNDs is yet to be defined. The aim of the study is to analyse the clinicopathological status of patients who underwent retroperitoneal lymphnode dissection (RPLND) for carcinoma ovary and compare the size of the node on computerised tomography (CT) of abdomen with node positivity on histopathology (HPE). This is the first such study correlating CT findings of lymph node with pathological lympho-vascular invasion in RPLNDs done for carcinoma ovary from the Indian Subcontinent verified by literature search.
Methods: A retrospective study of all patients who underwent RPLND diagnosed with ovarian cancer in our hospital over a period of 5 years (2011-15).
Results: 41 patients with ovarian cancer who underwent RPLND were evaluated. Average age of study population was 49 years. Average tumor size was 9 cm. Analysis of para-aortic node size on CT abdomen with node positivity on HPE, a size criterion of 14mm or more was associated with node positivity. Analysis of correlation between size of the tumor and size of para-aortic node to para-aortic node positivity on HPE were both insignificant. There is correlation between size of the tumor to lymphovascular invasion on HPE.
Conclusions: The primary tumor size and para-aortic lymph node size can predict lymphovascular invasion and a node size criterion of 14mm or more on CT can predict node positivity.

Keywords: CT, Ovarian Cancer, RPLND

INTRODUCTION

Ovarian neoplasm encompasses tumors with various histologic patterns and different biologic behaviours. They grow rapidly and are predominately unilateral.[1] The cure rates are relatively high; and the aims of surgery are now on fertility preservation while obtaining negative margins. Importance has been placed on early diagnosis to minimize radical surgery. Comprehensive staging in ovarian cancer comprises of peritoneal cytology, inspection and palpation of abdominopelvic contents, lymph node dissection, omentectomy, and peritoneal biopsies along with removal of any suspicious lesion.[2]

The standard of care for patients with a clinical stage I disease includes unilateral salpingo-oophorectomy with surgical staging.[1]

The debate for the role of lymphadenectomy continues; however, many studies show no cases of nodal metastasis in patients with clinical stage I tumours of the ovary, not requiring the need for a lymphadenectomy.[3]

Lymphadenectomy is still an integral part of surgical staging and treatment for later stages of ovarian cancers and also has an important role in both staging and retroperitoneal debulking.[4,5]

Aim of the present study was to perform a clinic-pathological analysis of retroperitoneal lymph node dissection performed for carcinoma ovary in a multi-specialty tertiary care centre in Chennai, India over a period of 5 years and to compare the size of the node on imaging (CT abdomen) with node positivity on HPE. The analysis includes various factors such as relationship of presence of lymphovascular invasion to lymph node positivity, relationship of size of para-aortic node to histopathological examination, size of primary tumor and the histological nature of the tumor.

METHODS

A retrospective study was performed analyzing patients who underwent RPLND for carcinoma ovary between 2011 and 2015. All patients suspected to have carcinoma ovary on clinical examination underwent a transvaginal ultrasound and were tested for tumor marker CA125. A preoperative CT whole abdomen was also performed, and the presence and size of the para-aortic nodes were recorded. Once the diagnosis was confirmed, patients were planned for retroperitoneal lymph node dissection (RPLND) and the same was done in conjunction with the gynecologists, who performed a salpingo-oophorectomy with the addition of a hysterectomy when indicated. Postoperative biopsy reports were reviewed and the pathological assessment of the primary tumour and para-aortic nodes were analysed. Adjunctive treatment was given based on the stage of the tumour.

Eligibility criteria of the were any patients with histologically proven ovarian carcinoma were eligible for the study. Previous chemotherapy or radiotherapy treatment eliminated patients from the study. Informed consent was obtained from all patients.

Surgery performed was done using Retroperitoneal lymph-node dissection with oophorectomy.

RESULTS

A total of 41 women were diagnosed with ovarian cancer in the 5-year study period. The average age of the population was 49 years and the average tumor size was 9 cm.

Analysis of the histologic pattern

On analysis of the pathological report diagnosed with ovarian malignancy, 66% were papillary serous carcinoma (27 patients), 12% were GCT (5 patients), 10% were mucinous (4 patients) and others were 12% (1 patient with borderline mucinous, 1 patient with endometroid, 1 patient with mixed type and 1 patient with teratoma with squamous cell carcinoma).

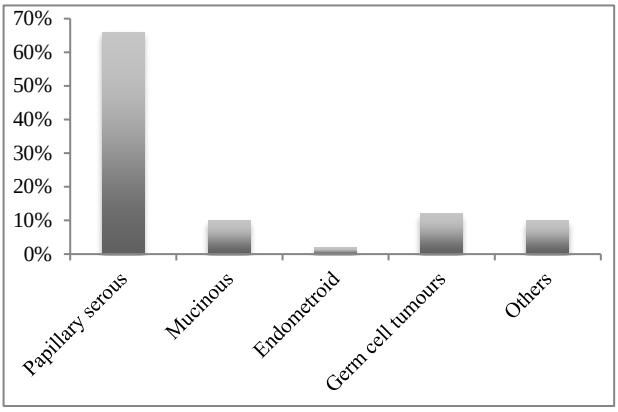

Figure 1: Histopathological subtypes.

Analysis of tumour size and para-aortic node size to node positivity on HPE

On analysis of all patients who underwent RPLND for ovarian maligancy, 7 patients (17%) had positive para-aortic nodes and 4 patients (10%) had other nodes that were positive. Among the patients who had other nodes positive, also had positive paraaortic nodes. There were no patients who had other nodes positive without a positive paraaortic node.

Table 1: Paraaortic node positivity ranks.

Paraaortic node positivity		N	Mean rank	Ranks
Size of tumour	No	35	21.87	765.50
	Yes	6	15.92	95.50
	Total	41		
Size of node	No	35	20.53	718.50
	Yes	6	23.75	142.50
	Total	41		

Table 2: Paraaortic node positivity group statistics.

Paraaortic node positivit		N	Mean	SD	SEM
Size of tumour	No	35	9.51	5.249	0.887
	Yes	6	6.33	1.751	0.715
Size of node	No	35	1.74	0.919	0.155
	Yes	6	2.83	3.061	1.249

Table 3: Test statistics concerning paraaortic node positivity.

		Tumor size	Node size
Mann-Whitney U		74.500	88.500
Wilcoxon	W	95.50	718.500
	Z	-1.133	-0.668
Asymp. sig. (2- tailed)		0.257	0.504
Exact sig. 2*(1-tailed sig.)		0.268[b]	0.552[b]

b=Not corrected for ties

The average size of the para-aortic node among node positive patients was 2.6cm and whereas the average size of the para-aortic node among node negative patients was 1.7cm. A statistical analysis of the correlation of size of tumour and size of para-aortic node to para-aortic node positivity were both insignificant with a p value of 0.27 and 0.55 respectively.

Analysis of lympho-vascular invasion with tumor size and paraaortic node positivity

On analysis of lympho-vascular invasion among 41 patients with proven ovarian malignancy, 29% patients had lympho-vascular invasion on histopathological examination (12 patients). A statistical correlation between presence of lympho-vascular invasion to size of the tumor and para-aortic node positivity was significant with p value of .006. Presence of lympho-vascular invasion can suggest paraaortic node involvement suggesting poor prognosis.

Table 4: Lymphovascular invasion positivity ranks.

Lymphovascular invasion positivity		N	Mean rank	Sum of ranks
Size of tumour	No	29	24.28	704.00
	Yes	12	13.08	157.00
	Total	41		
Size of node	No	29	20.60	597.50
	Yes	12	21.96	263.50
	Total	41		

Table 5: Lymphovascular invasion group statistics.

Lymphovascular invasion positive		N	Mean	SD	SEM
Size of tumour	No	29	10.41	5.308	0.986
	Yes	12	5.75	1.658	0.479
Size of node	No	29	1.76	0.951	0.177
	Yes	12	2.25	2.221	0.641

Table 6: Grouping variable of lymphovascular invasion positivity.

		Tumor size	Node size
Mann-Whitney U		79.000	162.500
Wilcoxon	W	157.000	597.500
	Z	-2.741	-0.361
Asymp. sig. (2- tailed)		0.006	0.718
Exact sig. 2*(1-tailed sig.)		0.006[b]	0.745[b]

b=Not corrected for ties

Analysis of size of para-aortic node on CT with node positivity on HPE

On analysis of size of para-aortic node on CT images of patients who underwent RPLND for ovarian malignancy with node positivity, 26% (11 patients) had a positive paraaortic node on CT. Among 11 patients with positive node on CT, 82% (9 patients) with node size of 14mm or more were positive on histo-pathological examination and 18% (2 patients) with node size less than 14mm were negative on histo-pathological examination. A size criterion of 14mm or more was highly suggestive of node positivity on HPE. It was also noted that patients who had no node enlargement on CT, also had no para-aortic node positivity on HPE.

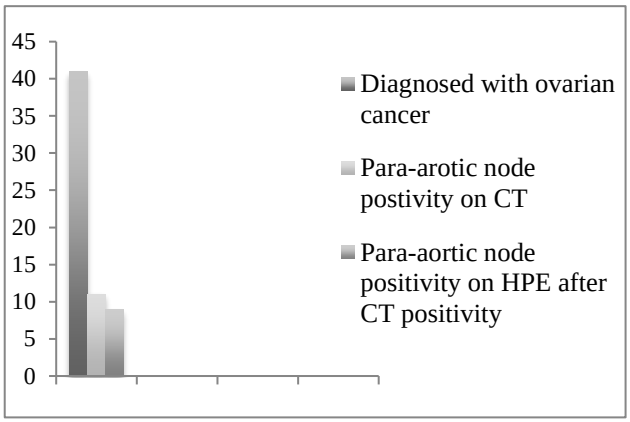

Figure 2: Paraaortic node size in cm(left) to node positivity (right).

DISCUSSION

One of the factors that affect the prognosis and the decision to give adjuvant treatment for a patient with ovarian malignancy is lymphovascular invasion. This study shows that the size of the primary tumour and size of para-aortic lymph node can predict lymphovascular invasion. A larger study can help define the exact numerical cut-off for this correlation and the presence of para-aortic node on CT alone is not enough to ascertain the stage of patient. It depends on primary tumour size, tumour grade, lymphovascular invasion determined after an adequate retroperitoneal lymph node dissection. A size criterion of 14mm or more on CT can suggest FIGO stage 3 ovarian carcinoma.

The average age of the patients analysed was 49 years and the average tumor size was 9cm. 66% were papillary serous carcinoma. 7 patients (17%) had positive para-aortic nodes and 4 patients (10%) had other nodes that were positive. There were no patients who had other nodes positive without a positive para-aortic node. The average size of the para-aortic node among node positive patients was 2.6 cm and whereas the average size of the para-aortic node among node negative patients was 1.7cm which did not have a significant statistical correlation. 29% patients had lympho-vascular invasion on histopathological examination (12 patients). A statistical correlation between presence of lympho-vascular invasion to size of the tumor and para-aortic node positivity was significant with p value of 0.006. On analysis of size of para-aortic node on CT images of patients who underwent RPLND for ovarian malignancy

with node positivity, 26% (11 patients) had a positive paraaortic node on CT. Among 11 patients with positive node on CT, 82% (9 patients) with node size of 14mm or more were positive. There are studies analysing the extent and clinicopathological status of RPLNDs but comparison of these results to CT findings has not been done.[14-16]

Ovarian malignancy is life threatening.[6] Only one third of cases are diagnosed in the early stages of the disease. Lymphatic node metastasis results in a change from stage I to stage III. 5-year survival decreases from more than 90% to around 20% - 60% if there is presence of lymph node metastasis and adjuvant therapy is needed.[7-10] Despite a detailed history of lymphadenectomies in literature, there are limited number of studies.[10-12] Comparing CT findings to histopathology is not documented, hence the need for present study. The staging procedures of these studies and the extent of lymphadenectomies performed are probably institutional protocol rather than standard. The prevalence of lymph node involvement depends closely on the stage of the disease and the number of lymph nodes removed and examined.[9,13]

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