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Pattern of lymphatic metastasis in Pelvic Malignancies- Radio pathological correlation

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Abstract

Purpose

1. To identify the characteristics that suggests metastasis in pelvic lymph nodes.
2. To identify the location of lymph nodal metastases in primary and recurrent pelvic malignancies.
3. To study the relevance of nodal spread in tumor management.

Materials and Methods

A retrospective study was conducted in our department. A Dual slice CT scanner (Somatom emotion duo–Siemens) and a single slice CT scanner-Toshiba were used for the study. CT scan of the abdomen and pelvis was done with oral, rectal and IV contrast with 5mm slice thickness.

28 patients diagnosed with pelvic malignancies based on radiological and histo-pathological analysis were included in this study.

- The number of patients studied-28
- Carcinoma cervix-14
- Carcinoma ovary-5
- Carcinoma rectum-7
- Carcinoma endometrium-1
- Carcinoma vulva-1

Keywords: Pelvic lymph, Morphology, Inguinal

Introduction

The patients were sub divided on the basis of the primary organ involved. Each group was studied regarding the group of nodes involved, the size, morphology and enhancement pattern. The cases were also divided into the primary cases (newly diagnosed and have not undergone any treatment) and recurrent cases (patients who have been treated previously with surgery, radiotherapy or chemotherapy).

The nodal groups were divided into Para aortic nodes, Common iliac nodes, External iliac nodes, internal iliac nodes and Inguinal nodes. A peri-rectal group was added in cases of carcinoma rectum. The most common group involved in each malignancy was studied.

The sizes of the metastatic nodes were determined and their size range and the average size in each carcinoma group were calculated. The short axis diameter was used for the calculations.

The nodes were also divided into regional group and non regional group according to the specific malignancy. The regional group represents the group usually in close proximity to the site of origin of the malignancy and is usually involved first in the nodal spread.

The enhancement pattern of the nodes on post contrast was studied and was divided into necrotic (when non enhancing areas were noted) and non necrotic (relative homogenous enhancement). The nodes were divided morphologically into round when they had equal short and long axis measurements otherwise grouped as oval.

Observations

Carcinoma Rectum

Out of the 7 cases studied 4 cases were primary and 3 cases were recurrence. 6 patients had peri rectal group involvement and Common iliac nodes were seen in 1 patient. No other nodes were involved. Thus the most common nodal group involved was the peri rectal

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nodes. The size range of the nodes were 5mm to 15mm with an average size of 10 mm. The majority of the nodes were oval in morphology and there was homogenous enhancement in 6 out of 7 cases. Necrosis was seen in only one patient who was a recurrence case treated with radiotherapy.

Carcinoma Ovary

The number of cases were 5 with 4 primary case and 1 recurrence. Common iliac node involvement was seen in 1, Internal iliac nodes in 1, External iliac nodes in 1 and Para aortic nodes in 4 patients. Hence the most common nodal group involved was para aortic nodes. The size ranged from 9mm to 30mm with an average size of 12 mm. the nodes were oval in shape and showed homogenous enhancement in all the cases.

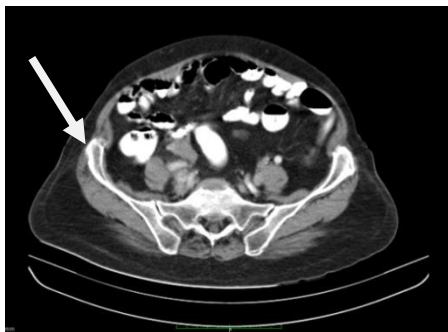


Fig 1: External iliac node in Ca ovary

Carcinoma Cervix

This was the largest group in our study with 14 cases. The primary cases were 5 and secondary cases were 9. Para aortic nodes were seen in 4 cases, Common iliac nodes in 3, External iliac nodes in 5, internal iliac nodes in 3 and inguinal nodes in 3 patients. Most common nodal group involved was External iliac. The size ranged from 7mm to 45mm with an average size – 20 mm (for Pelvic nodal group) and 10mm (for Para aortic). Most of the nodes were oval. Homogenous enhancement was seen in 8 cases and necrotic nodes were seen in 6 patients out of which 4 patients had a prior history of radiotherapy.



Fig 2: Necrotic External iliac node in Ca



Fig 3: cervix inguinal node in Ca cervix

Endometrial Carcinoma

One patient with endometrial carcinoma was included in the study which was a primary case. This patient had involvement of the external iliac nodes with homogenous enhancement. The average size of the nodes was 35mm.

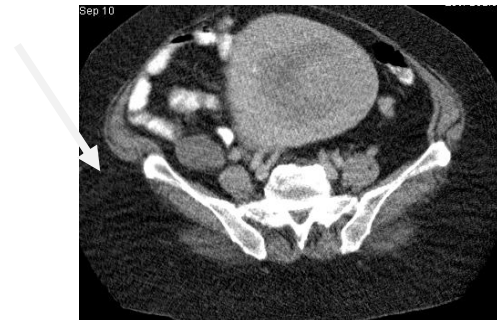


Fig 4: External iliac node in endometrial Ca

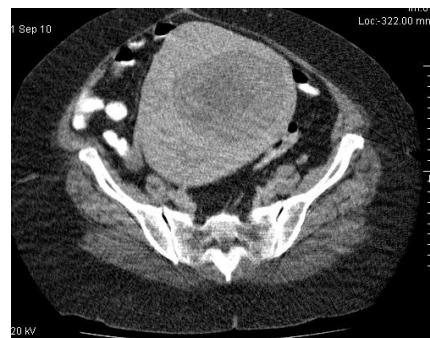


Fig 5: Ca endometrium showing endometrial thickening

Vulval Carcinoma

One primary case with Vulval carcinoma was included in the study. The patient had external iliac and inguinal nodes involvement. The nodes showed necrosis with oval shape and an average size of 45mm.



Fig 6: Bilateral inguinal nodes in Ca vulva



Fig 7: Ca Vulva

Discussion

- The size of the node is the most commonly used criteria for the detection of metastasis. Conventionally Nodes larger than 8mm in para-aortic, 1 cm in abdomen and 1.5 cm in inguinal (Short axis) are considered to represent metastases in patients with known primary. However it is well known that the smaller nodes may sometimes harbor the malignant cells or that the larger nodes may only be reactive and thus may not truly represent the metastases. In our study we have found that the involved nodes are usually enlarged with metastatic para aortic and peri rectal nodes being smaller in size with average size of 10mm and the metastatic iliac nodes and inguinal nodes being larger measuring 20mm to 40mm.
- The heterogeneous enhancement of the node was suggestive of nodal tumor spread. Necrotic nodes are commonly seen in carcinoma cervix and vulval carcinoma. Predominantly homogenous enhancement pattern is seen in rectal, ovarian and endometrial malignancies.
- Loss of oblong shape of the node is considered suggestive of malignancy but in our study we observed that most of the nodes that were involved were oval in morphology suggesting loss of shape may not be a sensitive feature of tumor spread.
- Most common lymph nodal groups involved for the malignancies are as follows:
 - Carcinoma Ovary-para aortic
 - Carcinoma Cervix-external iliac
 - Carcinoma Rectum-peri rectal
 - Endometrial carcinoma-external iliac
 - Carcinoma Vulva-inguinal and external iliac.

- Primary and recurrent cases had similar lymph nodal metastatic pattern in terms of lymph node groups involved.
- Thus the regional nodes are the most common nodes involved.

The lymph node involvement is an important criteria for further Patient management. When the case is a primary case (non-treated case) with regional lymph node involvement then the patient may be considered for treatment with a curative intent. When the distant nodes [non regional nodes] are involved then the patient management is palliative. The recurrent cases are always considered for palliative treatment only. The regional and distant nodes for each tumor is given in table 2.

The management of our cases was as follows:

Primary Cases (15)

- Ca Cervix-Primary cases-5, all with regional nodal spread (3 cases surgery with curative Radiotherapy & 2 cases curative Radiotherapy)
- Ca Ovary-Primary cases-4, all with regional nodal spread (surgery with curative Radiotherapy)
- Ca Endometrium - Primary case-1, regional nodal spread (surgery with Radiotherapy)
- Ca Vulva-Primary case-1, with distant spread (palliative Radiotherapy)
- Ca Rectum-Primary cases-4, all with regional spread (surgery with curative Radiotherapy)
- Recurrences (13)-Palliation chemotherapy and radiotherapy.

Table 1: The study observations

| Characteristics | Ovary | Cervix | Rectum | Endometrium | Vulva |
|----------------------------------|-----------------|-----------------|-----------------|------------------|-------------------------|
| Most common nodal group involved | Para aortic | External iliac | Peri rectal | External iliac | Inguinal External iliac |
| Size (mm) | 12 (9 to 30) | 15 (7 to 45) | 10 (5 to 15) | 35 (20 to 42) | 45 (25 to 50) |
| Shape | oval | oval | oval | oval | oval |
| Necrosis | - | +/- | - | - | +/- |

Table 2: The regional and non regional nodes for the pelvic malignancies

| Carcinoma | Para Aortic | Common Iliac | External Iliac | Internal Iliac | Inguinal |
|-------------|-------------|--------------|----------------|----------------|----------|
| Rectum | N | N | N | R | N |
| Ovary | R | R | R | R | N |
| Cervix | N | R | R | R | N |
| Endometrium | R | R | R | R | N |
| Vulva | N | N | N | N | R |

N: non regional.
R: regional.

Conclusion

- Nodal staging is important in patient management. Patients with regional nodal metastases can be considered for treatment with curative intent.
- Regional nodes are the most common nodes involved in pelvic malignancies.
- Node enlargement, necrosis is suggestive of malignancy. Nodal metastases from carcinoma cervix and vulval carcinoma can be necrotic.

Limitations: Single case of vulval carcinoma and endometrial carcinoma were included in the study.

References

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