CASE REPORT

'Trident sign' in pelvis: sinister sign with poor prognosis

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SUMMARY

The perineural spread of the cancer through the lumbosacral plexus gives an appearance of 'trident sign' on contrast-enhanced CT scan and MRI. It is associated with adverse survival rates and carries a poor prognostic value.

BACKGROUND

Perineural spread is a well-established route for the spread of malignancies. It is commonly seen in the head and neck cancers, melanoma and in the abdominal malignancies like pancreas, prostate, rectum, bladder and cervix.¹⁻⁵ In pelvic malignancies, it can be the explanation for part of lumbosacral plexopathies. There is transmission of the tumour cells along the nerve sheath of the lumbosacral plexus giving an appearance of 'trident sign' on CT scan. The perineural spread is associated with poor prognosis and have implications in the management protocol.

CASE REPORT

A 57-year-old female patient who was the known case of carcinoma of cervix (stage 1b) underwent total abdominal hysterectomy 4 years back in 2010 and was lost to follow-up for the last 2 years. The patient returned to the surgical oncology outdoor patient department with dull aching pain in the left lower back, gluteal region and upper thigh. No significant sensorimotor deficit was noted. The neurological status of the patient was normal. Lumbosacral spine radiographs, both antero-posterior and lateral views were normal. The patient underwent contrast-enhanced CT scan for further workup and planning. CT scan showed a well-defined lobulated soft tissue mass measuring 5.4×5.4 cm in the left aspect of the pouch of the Douglas at the level of the vaginal vault (figure 1A) suggestive of vault recurrence. The mass lesion was infiltrating the left bladder base, vesicoureteric junction, distal left ureter with proximal left hydro-ureteronephrosis. Posteriorly, it was involving the mesorectal fascia with infiltration in the mesorectal space; however, rectum appeared spared. Laterally, there was enhancement and thickening of the left lumbosacral plexus of L5-S3 nerve root and left sciatic nerve (figure 1B) suggestive of perineural spread. On the sagittal oblique maximum intensity projection images, the enhancing and thickened lumbosacral nerve roots and sciatic nerve gave the appearance of a 'trident' (figure 2A and B), with

Figure 1 (A) Axial contrast-enhanced CT (CECT) image shows lobulated mass in the left pouch of the Douglas at the level of the vaginal vault suggestive of vault recurrence with thickened left sciatic nerve (arrow). (B) Axial CECT image shows thickened and enhancing left lumbosacral plexus (arrow) suggestive of perineural spread of tumour.

nerve roots forming the prong and sciatic nerve forms the handle of the spear forming the 'trident sign'. Multiple nodules were seen in the bilateral lung parenchyma with areas of cavitations s/o metastasis along with segmental collapse of the left upper lobe (figure 2C).

DISCUSSION

Perineural spread is the well-established route of tumorous spread in the various malignancies. This phenomenon is commonly noted in the head and neck malignancies and in various abdominal malignancies such as that of pancreas, prostate, rectal, bladder and cervix. In our case, the patient had cervical cancer with vault relapse and lung metastasis and perineural spread along the left lumbosacral plexus in the sciatic nerve, explaining the

Figure 2 (A) Oblique sagittal maximum intensity projection CT image shows thickened lumbosacral nerve roots and sciatic nerve, forming the prong and handle of the trident spear, respectively (arrow). (B) Photograph of the trident weapon. (C) Axial contrast-enhanced CT lung image shows cavitary metastases in the left upper lobe close to the fissure.

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symptoms of the patient. Zhang *et al* reported that perineural spread of cervical cancer is associated with depth of stromal invasion, tumour size, invasion of the parametrium and lymphovascular space and lymph node metastasis.⁶ Wei *et al* have shown that the perineural spread in cervical cancer is associated with lymphovascular space invasion and lymph node metastasis.⁷ The perineural spread in the lumbosacral plexus leads to the diffuse thickening of the nerve plexus, giving appearance of ‘trident’ on the CT scan. This sign is also expected to be observed in coronal oblique MR images; however, for this patient, the MRI examination was not done. Diffuse thickening of the nerve plexus can be seen in multiple conditions such as tumour involvement in malignant and benign nerve sheath tumour, metastatic infiltration and lymphoma. Inflammatory and systemic conditions such as inflammatory neuritis, radiation neuropathy, sarcoidosis, connective tissue disorder, hereditary neuropathies, diabetic amyotrophy and endometriosis can also cause diffuse thickening of the nerve plexus; however, we could not find the description of trident sign in any of these conditions in the literature until now.⁸ The proposed ‘trident sign’ implying extension along the nerve plexus is a sinister sign that holds poor prognosis and can be useful in diagnosing perineural spread of pelvic malignancies. In early stage cervical cancer, postoperative radiotherapy is indicated for patients with high-risk factors.^{9–10} High-risk factors include parametrial invasion, lymph node metastasis and positive margins. Studies by Wei *et al* have shown perineural spread to be an additional risk factor for cancer recurrence and postoperative radiotherapy to be given in the patients with perineural spread. Even these patients are poor candidates for the

nerve sparing radical hysterectomy. Thus, perineural spread is an important parameter for the effective management protocol of the carcinoma of cervix.

Contributors LG: Reported and diagnosed the case report. MY: Edited and planned the case report. ST: Guided and discussed the case report.

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Learning points

- ‘Trident sign’ denotes the perineural spread of the tumour in the lumbosacral plexus.
- It holds prognostic value and should be assessed during imaging and surgical evaluation of the tumour.
- Postoperative radiotherapy is given to patients with perineural spread of the carcinoma of cervix.

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