CASE REPORT

Alveolar soft part sarcoma

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SUMMARY

Alveolar soft part sarcoma (ASPS) is a rare form of soft tissue sarcoma and is most often seen in adolescents and young adults. Despite its unique histology and well-characterised genetic translocation, many questions remain regarding the pathogenesis and treatment of this tumour type. Surgical excision of the primary tumour and pulmonary metastases has resulted in prolonged survival of some patients while the benefit of adjuvant chemotherapy and/or radiotherapy has been disputed. A 35-year-old woman presented with a tumour in the right leg and right side of the mandible along with active metastasis to lungs and multiple skeletal sites.

BACKGROUND

Alveolar soft part sarcoma (ASPS) is a very rare sarcoma accounting for approximately 0.5–1% of all soft tissue sarcomas.¹ It is a slow-growing but nevertheless malignant soft tissue tumour arising in muscles, commonly seen in the age group between 15 and 35 years of age with slight increased predilection in young women by a ratio of 3:2.² Clinically it presents as a painless, slow, indolent soft growing lesion which rarely causes functional impairment. Primary tumours are often large and highly vascular, and often present as pulsatile mass. Head and neck, especially the tongue and orbit are common sites of involvement in children, whereas it occurs in muscles of upper and lower extremities in older adults. Lesion most commonly metastasises to lungs followed by central nervous system. Risk factors for metastasis are older age and tumour size greater than 5 cm. Taking into consideration the rarity of the disease, complete and thorough knowledge of its clinical behaviour, pathology and optimal treatment is still obscure. Majority of previous reports have suggested that complete surgical excision of the primary tumour in its early stages is the mainstay of treatment, as it is resistant to conventional cytotoxic chemotherapy. But, in advanced cases, like with multiple metastatic involvement and recurrent cases, only palliative treatment is preferred due to its bad prognosis. According to previous literature data, the 5-year survival rate is reported to be 45–88%, 38% at 10 years and 15% at 20 years.³

CASE PRESENTATION

A 35-year-old woman reported to the outpatient department of Maulana Azad Institute of Dental Sciences, New Delhi, in February 2012, with pain and swelling in the lower right jaw since the past 2.5 months. The patient gave a history of swelling in the right leg since the past 2 years which was associated with pain. Medical history was unremarkable.

Dental history revealed that the patient had undergone extraction of 45, 46, 47 and 48 about 1 month ago because of pain and decay. She also reported a history of weight loss (approximately 10–15 kg) within a span of 1 year despite adequate food intake. There was a history of fever since the past 3 months. On examination, the right submandibular lymph nodes of the patient were palpable, firm in consistency and fixed to the underlying structures with a size of approximately 1.5×1.5 cm. On general examination, a diffuse swelling was present on the anterior aspect of the right leg associated with pain and the overlying skin was pigmented in the central region and was slightly tender with no secondary changes (figure 1). On extraoral examination, there was a bony hard swelling present in the lower border of the right mandible, extending from just behind the chin region to the angle of the mandible. The swelling was non-tender with no evidence of changes in the skin overlying the swelling (figure 2). On intraoral examination, there was expansion of the buccal cortical plate with obliteration of the mucolabial fold, extending from the distal aspect of 44 to the retromolar area which was slightly tender on palpation. There was no history of any pus discharge, bleeding, and sinus or fistula formation; there was no symptom of paraesthesia; 45, 46, 47 and 48 were missing (figure 3).

INVESTIGATIONS

Preliminary laboratory investigations were advised to the patient which revealed increased erythrocyte sedimentation rate (32 mm/h) and reduced haemoglobin (10 g %). Fine-needle aspiration cytology was performed from the lesion in the mandible and leg which showed features similar in morphology to ASPS.

Further conventional radiographs, contrast-enhanced CT (CECT) of the head and neck, and positron emission tomography (PET) were advised to the patient. Orthopantomogram revealed a multilocular radiolucency involving the body of the right mandible in the molar region with irregular borders along with destruction of superior and inferior border of the mandible in the region (figure 4). CECT axial sections of the head and neck revealed a large heterogeneously enhancing expansile intraosseous lesion, measuring 2.4×3×3.6 cm in size with associated cortical destruction in the body of the mandible on the right side (figure 5). Some of the axial sections at higher level also revealed lytic lesions in the calvaria (figure 6). MRI of the right leg revealed well defined enhancing lesion on the anterolateral aspect involving extensor digitorum longus resulting with loss of fat planes (figure 7). PET of the patient showed primary pathology in the right leg with active metastasis to lungs

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Figure 1 Diffuse swelling present on the anterior aspect of the right leg with overlying skin pigmented in the central region.

Figure 2 Bony hard swelling present in the lower border of the right mandible.

Figure 3 Expansion of buccal cortical plate with the obliteration of the mucolabial fold, extending from distal aspect of #44 to retromolar area.

and multiple skeletal sites which were calvarium, right mandible, L1, L3 vertebrae, right ilium, right ischial tuberosity, right femur, left femoral condyle and upper one-third of the right tibia (figure 8A, B). Biopsy of the lesion was performed from the leg and mandible. As the lesion was entered with blunt dissection, there was profuse bleeding and the tumorous masses were very fragile. Histopathological examination of the sites showed similar features—tumour composed of cells with eosinophilic vacuolated cytoplasm in small groups and sheets, the cells had vesicular and hyperchromatic nucleus, those with vesicular nucleus had prominent eosinophilic nucleolus. The cells were present in the background of fibrocollagenous tissue (figure 9A, B). Overall features were suggestive of ASPS. Many of the cells contained Periodic acid Schiff (PAS)–positive, diastase-resistant granule (figure 10). The cells were strongly positive for S100 and negative for desmin, myogenin (figure 11).

DIFFERENTIAL DIAGNOSIS

On the basis of clinical findings and radiographic examinations, provisional diagnosis of metastatic tumour was made with primary lesion in the right leg.

TREATMENT

The patient was referred to higher centres for further management, where chemotherapy was started on the patient.

Figure 4 Multilocular radiolucency involving the body of right mandible in the molar region with irregular borders.

Figure 5 Contrast-enhanced CT axial sections of the head and neck revealed a large heterogeneously enhancing expansile intraosseous lesion.

Figure 7 MRI of the right leg revealed well defined enhancing lesion on anterolateral aspect.

OUTCOME AND FOLLOW-UP

The patient is kept under follow-up, but there is no significant improvement in the swelling present on the leg and right side of the mandible.

Figure 6 Contrast-enhanced CT axial sections at higher level revealed lytic lesions in the calvaria.

DISCUSSION

ASPS is a rare tumour and accounts for 0.5–0.9% of all soft tissue sarcomas.⁴ Christopherson first described its unique histological and cytological features in 1952.⁵ ASPS comprises only 1% of all soft tissue sarcomas.⁶ It was first described as a discrete clinical entity by Smetana and Scott in 1951, and in view of its unknown cellular origin, given the descriptive title of alveolar soft part sarcoma the following year. ASPS is seen mostly in children and adolescents. However, its usual age range of presentation is from 15 to 35 years, our patient falling into the same group. Extremity involvement, particularly lower limb, is commonly described in adults;^{1,7} head and neck area, particularly the tongue and orbit are the favoured sites in children. Most studies have found a female preponderance in adult patients although no such predilection has been noted in children. Lieberman *et al* reviewed the clinical and histopathological features of 102 cases of ASPS. In their study, the median age at diagnosis was 22 years (range 2–71 years) and the female-to-male ratio was 1.5:1, with a higher female-to-male ratio in childhood and adolescence.⁸ In accordance with the above facts, the patient who reported to our department was a 35-year-old woman with a swelling in the lower right side limb. ASPS arises in association with skeletal muscles or musculo-fascial planes, a fact that explains the strong predilection of this tumour for the thighs, buttocks and abdominal or chest walls.⁹ In children, a substantial percentage of cases occur in the head and neck, often in the orbit or tongue.¹⁰ It tends to grow slowly and insidiously, often with a long clinical history and a large mass at presentation, similar to our patient, who had a large swelling in the right leg. Despite the slow growth rate of the primary tumour, metastases are common. Metastases are found

Figure 8 (A and B) Positron emission tomography showing primary pathology in the right leg with active metastasis to the lungs and multiple skeletal sites.

most often in the lungs, followed in frequency by bone and brain.¹¹ They are detected in about 20–25% of patients at diagnosis, as in our patient, metastasis to lungs and multiple skeletal sites which were calvarium, right mandible, L1, L3 vertebrae, right ilium, right ischial tuberosity, right femur, left femoral condyle and upper one-third of the right tibia was seen.¹² It has been reported that certain organs can be very unusually targeted by ASPS malignant cells. Part of the list includes female genital tracts, breasts and mediastinum.¹³ ASPS behaves as a relatively indolent, but relentless sarcoma, characterised by late metastases and an extended clinical course; survival rates of 77% at 2 years, 60% at 5 years, 38% at 10 years and only 15% at 20 years have been reported by Lieberman *et al.*⁹ The prognosis for children with ASPS may be considerably better; lingual and orbital tumours also have very high survival rates, possibly reflecting a combination of small size at the time of diagnosis and younger patient age.¹⁴

ASPS tumour cells exhibit characteristic PAS-positive, diastase-resistant, intracytoplasmic rhomboid crystals and act as a diagnostic marker for ASPS.^{15 16} In addition, tumour cells exhibit characteristic round, regular, eccentrically placed nuclei with vesicular chromatin and prominent nucleolus.¹⁶ These histopathological findings were present in our patient, confirming the diagnosis of ASPS. No histopathological features are predictive of prognosis in patients with ASPS.¹⁴

Metastasis is common for lungs (42–65%), brain and bone, corresponding to our patient except for the brain metastasis. Lymph node involvement is unusual. Patients with localised form of the disease are in the mean age of 22 years and have favourable prognosis with prolonged survival. Metastatic lesion alone or combination of local recurrence with metastatic lesion is a frequent complication.¹⁶

CT and MRI mainly help to decide the tumour-free resection margins. The presence of a hyper-intense lesion with central

Figure 9 (A and B) Photomicrograph showing tumour cells having abundant eosinophilic, granular cytoplasm arranged in solid nests and alveolar structures, separated by thin, sinusoidal vessels (H&E (A)×100, (B) ×200).

Figure 10 Special stain (Periodic acid Schiff) showing intracellular Periodic acid Schiff-positive crystal-like material.

Figure 11 Immunohistochemistry showing positivity for S100 (×200).

necrosis and flow voids within the lesion on T1-weighted and T2-weighted MRI will support the diagnosis of ASPS.¹⁶

Accurate diagnosis and treatment of this unusual tumour requires clinical suspicion and clinicopathological correlation with appropriate radiological studies. Either alone or in combination, surgery and radiotherapy are the favoured modes of therapy in such situations.¹ Chemotherapy, although effective for the primary lesion, has not been found to be helpful in metastasis to the brain primarily because of inability of these drugs to cross the blood–brain barrier.¹⁷

Learning points

- ▶ Alveolar soft part sarcoma (ASPS) refers to a rare soft tissue sarcoma which typically occurs in young patients, characterised by a distinctive histological appearance, and the prognosis is poor.
- ▶ ASPS is relatively indolent but has a high propensity for metastasis. Early diagnosis and complete excision of a small primary tumour is important in the treatment of ASPS.
- ▶ Treatment with surgery and radiation is recommended for the primary place where the sarcoma arises. For disease that travels to the lungs, sometimes surgery is possible to remove nodules, but more typically chemotherapy is the only option for treatment.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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