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Histopathological Spectrum of foot lesions: A five-year retrospective study in a tertiary care centre

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Abstract
Introduction: Diverse lesions ranging from infective, inflammatory to neoplastic lesions occur in foot. There is not much literature available on the spectrum of lesions that affect foot.
Aims and objectives: This study aims to enumerate the clinical and histopathological spectrum of lesions of foot.
Materials and methods: This is a hospital based retrospective study of five years duration done between January 2016 to December 2020. The details are collected from the patient requisition forms and pathology records.
Results: On histopathological examination, the lesions were broadly classified into non-neoplastic and neoplastic. The non-neoplastic lesions were 12 cases (42.8%), of which infective aetiology were 3 cases (10.7%) and non-infective were 9 cases. All the infective aetiology cases were of actinomycosis (3 cases). The commonest non infective pathology was ganglion cyst (4 cases). The common benign tumours encountered were benign nerve sheath tumours (4 cases). The intermediate grade tumours were two cases which were one case each of pigmented villonodular synovitis and dermatofibrosarcoma protuberans. The malignancies encountered were synovial sarcoma, squamous cell carcinoma, and malignant melanoma), of which malignant melanoma was most common (3cases).
Conclusion: This study enumerates the lesions of foot, and emphasises the clinical and histopathological features of foot lesions.

Keywords: benign nerve sheath tumours, pigmented villonodular synovitis, dermatofibrosarcoma protuberans, synovial sarcoma, squamous cell carcinoma, malignant melanoma

Introduction
A diverse variety of lesions ranging from infective, inflammatory to neoplastic lesions occur in foot. Almost all lesions that occur elsewhere in the body can affect foot as well [1]. However, there is not much literature available on the spectrum of lesions that affect foot [2]. This paper aims to present the histopathological features of lesions that affect the foot.

Aims and objectives
This study aims to enumerate the clinical and histopathological spectrum of lesions of foot.

Materials and methods
This is a hospital based retrospective study of five years duration done between January 2016 to December 2020 after obtaining approval from the institutional ethics committee board. All the cases of foot and ankle lesions submitted to the department of pathology, Guntur medical college, Guntur, Andhra Pradesh, India, during the study period are included in the study. The details are collected from the patient requisition forms and pathology records. The specimens are received in 10 percent neutral buffered formalin, after routine processing, paraffin blocks are prepared and the sections cut are stained with Haematoxylin and eosin. The slides are reviewed.

Statistical analysis: the details were entered in Microsoft excel sheet and percentages and mean were calculated. Multivariate analysis was done with Fisher exact test using epi info software and p value of <0.05 was considered as significant.

Results

There were 28 cases during the study period of five years. The age range was between 11 years to 70 years, with a mean age of 35years. Maximum cases were seen between 31 to 40 years (table 1).

Table 1: Showing age distribution of the cases

Age range	Number of cases
Less than 20 years	4(14.3%)
21 to 30	2(7.1%)
31 to 40	12(42.9%)
41 to 50	7(25%)
51 to 60	1(3.6%)
61 to 70	2(7.1%)

There was no gender predilection. Male: female ratio was 1:1 (14 cases each)

Laterality: right sided lesions were more common accounting for 20 cases. Left sided lesions were 8 cases.

Table 2: Showing frequency distribution according to location and size

Location	Number of cases	Size of the swelling	Number of cases
Ankle	8(28.6%)	Less than 1cm	6(21.5%)
Foot	18(64.3%)	1 to 2 cm	10(35.7%)
Great toe	2(7.1%)	2 to 5 cm	7(25%)
		More than 5 cm	5(17.8%)

The size of the lesion or swelling ranged from less than 1centimeter (cm) to more than 5 centimetres in the greatest dimension. The average size was 2 cm. In most of the tumours, the size ranged between 1 to 2 cm. The details shown in table 2.

The type of specimens received were excision specimens in 6 cases, amputation specimen in 1 case and wedge resection in one case.

On histopathological examination, the lesions were broadly classified into non neoplastic and neoplastic. The non-neoplastic lesions were 12 cases (42.8%), of which infective aetiology were 3 cases (10.7%) and non-infective were 9 cases, summarised in table 3. All the infective aetiology cases were of actinomycosis (3 cases). The commonest non infective pathology was ganglion cyst (4 out of 9 cases, accounting for 44.4%).

Neoplasms were 16 cases, of these benign were 7 cases, intermediate grade were 2 cases and malignant were 7 cases. The details are shown in table 3.

Table 3: Neoplasma

HPE diagnosis	Number of cases
Actinomycosis	3(10.7%)
Epidermoid cyst	2(7.1%)
Ganglion	4(14.3%)
Hamartoma	2(7.1%)
Pyogenic granuloma	1(3.6%)
Lipoma	2(7.1%)
Arteriovenous malformation/ haemangioma	1(3.6%)
Benign nerve sheath tumour	4(14.3%)
Giant cell tumour of tendon sheath or pigmented villonodular synovitis	1(3.6%)
Dermatofibrosarcoma protuberans	1(3.6%)
Synovial sarcoma	2(7.1%)
Malignant melanoma	3(10.7%)
Squamous cell carcinoma	2(7.1%)

The common benign tumours encountered were benign nerve sheath tumours (4 cases out of 7 neoplasms, accounting for (57.1%).

The intermediate grade tumours were two cases which were one case each of pigmented villonodular synovitis (figure 1C) and dermatofibrosarcoma protuberans

The common malignancies encountered were synovial sarcoma, squamous cell carcinoma (figure 1A), and malignant melanoma (figure 1B), of which malignant melanoma was most common (3 out 7 cases, accounting for 42.8%).

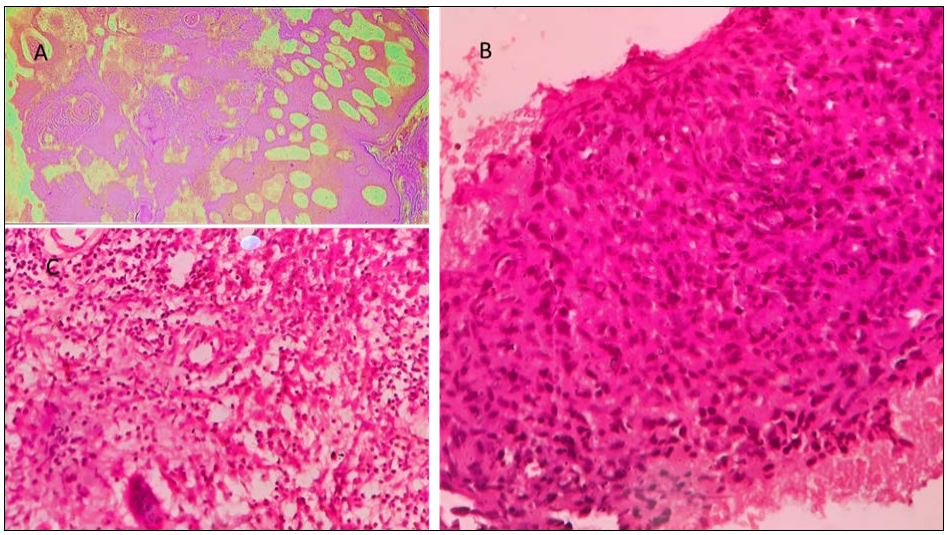

Fig 1A: squamous cell carcinoma (100x) showing squamous pearls and pleomorphic epithelial cells infiltrating stroma, figure 1B: malignant melanoma (400x) showing pleomorphic epithelial cells with frequent mitosis, figure 1C: pigmented villonodular synovitis (400x) showing giant cells and pigmented macrophages.

Multivariate analysis was done using Fisher exact test with p value < 0.5 considered as significant. P value was not significant (p= 1) when malignant and non-malignant tumours were compared for size (less than 2 cm and more than 2cm) and age (p =0.1453) (less than 50 years and more than 50 years)

Discussion

The literature on type of lesions affecting foot is limited [2] and this article addresses the same. Bone and soft tissue lesions affecting elsewhere in the body can affect foot and ankle as well [1]. The common lesions affecting the foot are usually benign neoplasms and tumour like conditions [3]. Malignant neoplasms of bone and soft tissue are less common in foot [4]. Though very rare, even metastasis from viscera have been reported in foot [5]. Owing to the rarity of neoplasms in foot there is unfamiliarity in clinicians about the management of these lesions. In addition, diversity of their nomenclature and histogenesis further complicate the situation [6, 7]. A systematic approach in management of these lesions is essential to tackle this issue.

In one of the previous studies of cytology of soft tissues from the same institute [8] we found that most common non infective pathology was epidermoid cyst and benign lesion was lipoma and malignancy was round cell tumour. In the present study, the commonest non infective pathology was ganglion cyst, benign lesion was schwannoma and mesenchymal malignancy was synovial sarcoma and epithelial malignancy was malignant melanoma. The results are different as compared to the previous study, because previous study included soft tissue swellings all over the body, whereas the present study includes only foot swelling, emphasising that lesions that occur elsewhere in the body can occur in foot as well, but frequency of different lesions varies according to the location.

Localised synovial sarcoma of foot is rare and reported to have favourable prognosis as compared to other sites,[9] especially in young patients and tumour size less than 3 cm, and can be managed without systemic therapy.[10]

Squamous cell Carcinoma of the foot is very common but underreported. Early diagnosis and prompt management can lead to limb conservation [11].

Melanoma of foot is considered to have better prognosis and some authors believe that it should be considered as separate sub group with specific management [12, 13].

Pigmented villonodular synovitis usually occurs in knee joint but can rarely occur in foot as well [14]. It is important to identify them for which histopathology is mandatory as they can recur if not excised completely [14].

The limitation of the study is the small sample size.

There are no new studies on the lesions of foot. This study enumerates the lesions of foot, and emphasises the clinical and histopathological features of foot lesions.

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Conflict of Interest

None

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