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Uncommon Neck Swellings: Aetiology and Management.

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Abstract:
Introduction: *The commonest swelling in the neck worldwide is a lymph nodal enlargement. The commonest cause of cervical lymphadenopathy varies from country to country and include Tuberculosis, Lymphomas, and metastatic cancers. However, there are a variety of less common causes of neck swellings, which are encountered in clinical practice. Because of their rarity, clinical diagnosis is rarely attained and they are often histological surprises after incisional or excision biopsy. Objective and Methods: It is useful to know the uncommon causes of neck swellings as they present a diagnostic dilemma as well as a therapeutic challenge. In this article, we document the clinical features of a few uncommon neck swellings that we encountered in our clinical practice along with their management along with review of relevant literature. Results: There were 6 patients of obscure neck swellings over a period of 5 years. Neck swellings of obscure aetiology comprised about 0.03 percent of the total neck swellings in Surgical Oncology OPD. FNAC report was inconclusive in all these cases. Axial imaging also failed to provide the diagnosis in any of these cases. However imaging was useful for deciding about resectability. Histopathology and Immunohistochemistry was the mainstay of diagnosis and surgery was curative in most cases.*

Keywords**:** *neck swellings, Castleman's disease, chondrosarcoma, ectopic hamartomatous thymoma, extra-cranial meningioma , cervical germ cell tumour, Infantile myofibroma.*

I. Introduction

A wide variety of diseases may present with neck swellings. Most diseases of lymph nodes like Tuberculosis, viral and fungal infections, and malignant neoplasms, both of the Head Neck region as well as from the Thoracic and Abdominal viscera may involve the cervical lymph nodes secondarily. Disorders of the normal neck structures like the thyroid gland or soft tissues may also cause neck swellings. Apart from these common causes, there are several obscure diseases which may also present as swellings in the neck. Some of them may not be true neoplasms and because of their rarity, the treating physician may be unaware of the diagnosis and appropriate management. It is useful to keep such rare entities in our minds when we are dealing with a neck swelling which is not fitting into the common causes on preliminary investigations. Familiarity with their clinico-radiological picture and pathological appearance will help the treating team to achieve the correct diagnosis and decide on the appropriate treatment without many unnecessary investigations.

II. Aims

In this article we analyse our data of the uncommon neck swellings that we have encountered in our hospital, which is a tertiary health care institute. We shall list the clinical features including the investigations that were done and the treatment offered to these patients along with their outcome. A review of available literature is also included.

III. Observations

There were178 patients of neck swellings who presented to our OPD from March 2011 to June, 2016. Patients with metastatic neck nodes where the primary tumour was also evident (mostly Oral cancers) were excluded from the analysis. Only pure neck swellings without any other swellings in the body were considered. Table 1 gives the distribution of the various cases.

Table 1: Incidence of various neck swellings in Surgical Oncology OPD

S.No	Diagnosis	No. of patients
1.	Metastatic cervical lymph nodes (Squamous)	38
2.	Metastatic cervical lymphadenopathy (others)	13
3.	Lymphoma	26
4.	Thyroid Swellings	85

5.	Soft tissue sarcomas	09
6.	Kimura's disease	01
7.	No definite diagnosis	06
	Total	178

Of the 6 patients with undiagnosed aetiology, 5 were lateral neck swellings and only one was central. The age range varied from 4 years to 60 years. The gender ratio was 1:1 (3 males and 3 females). Most of the swellings were of long duration, slowly progressive and painless. As is usual, all of them underwent FNAC of the swellings for initial diagnosis, but it was inconclusive or erroneous in all 6 cases. Three of the six patients underwent incision biopsy but they were all inconclusive. After appropriate axial imaging, all six swellings were deemed to be resectable and underwent surgery.Histopathology (supported by IHC) could give the correct diagnosis in all the cases. The post- operative period was uneventful. Two patients (Castleman's disease and Chondrosarcoma) were given adjuvant radiation. Given here are the brief case vignettes with relevant literature review.

Case 1: A 60 year old male presented to us with a painless, slowly growing swelling of 15 years duration in the right side of neck. He said he had noticed a recent increase in size of the swelling but was otherwise totally symptom free. On examination, there was a 16 cms by 8 cms soft, fluctuant swelling in the right neck along the Sternomastoid and deep to it(Figure 1). CT scan showed a multi-loculated solid-cystic lesion compressing the carotid sheath and extending up to the manubrium sterni. FNAC was inconclusive, showing few atypical spindle cells. With a provisional diagnosis of a Soft tissue sarcoma, wide excision of the mass was done. Intra-operatively the mass was found to be closely adherent to the periosteum of medial end of the clavicle and capsule of the right sterno-clavicular joint. Post-operative recovery was satisfactory. Histopathology report showed multiple cystic spaces lined by epithelial cells, nests and whorls of spindle cells and areas of mature adipose tissue. These features as well as IHC findings were consistent with a diagnosis of Ectopic hamartomatous thymoma. No further treatment was advised and the patient is recurrence free for 4 years now.

Discussion

Ectopic hamartomatous thymoma is an extremely rare neoplasm of uncertain histogenesis, which usually presents as a lateral neck swelling. It was described as a specific entity in 1984 by Rosai et al [1] who felt that the in addition to spindle cells , there were also lymphocytes arranged in Hassal corpuscle like patterns. They proposed that the tumour arose as a result of a developmental anomaly of the third arch and it probably contained ectopic abnormal thymic tissue. Subsequent histological studies, ultrastructural features and immunohistochemistry have all failed to establish a thymic source of origin of this tumour. The current concept of its histogenesis is that it probably is a mixed branchial anlage tumour [2]. Though there is some uncertainty regarding its tissue of origin, the clinical features of this tumour are very distinctive. In all the reported cases, there is a strong male gender preponderance [3]. The tumour is almost always situated in the lower neck with most reports mentioning a close relation with the sterno-clavicular joint [3]. The tumour is slow growing and most patients present in middle age. Although solid, there usually are areas of cystic changes within the tumour. The histological feature is a triphasic appearance composed predominantly of spindle cells, epithelial cells in nests or lining cystic spaces and variable amount of mature adipocytes in between [4]. Immunohistochemistry provides further confirmation of the non thymic origin of this tumour although the histological features are enough to make a diagnosis. Marshall et al did a literature review of this tumour in 2002 and found that in most of the cases, simple excision of the tumour had been done and had proved to be curative [3]. Our patient was a middle aged male who had a very slow growing lateral neck tumour which appeared solid-cystic on CT scan and which was adherent to the sterno-clavicular joint. Complete surgical excision has been curative for him too.

Case 2: A 14 year old female presented with a painless, slowly progressive swelling in the right side of the neck for almost 4 months. There was no fever or weight loss. FNAC of the lesion done outside showed few atypical lymphocytes suggestive of lymphoma. On examination, the swelling was about 5 by 3 cms oval firm, mobile, non-tender mass at level V just deep to the Sternomastoid. With a provisional diagnosis of Chronic lymphoma, excision biopsy of the mass was done. Intra-operatively, a few adjacent lymph nodes were also found enlarged and excised. Post operatively there was no complication. Histopathology report was Castleman's disease. She was advised adjuvant radiation. She is symptom free after more than 5 years of follow up

Discussion

Castleman's disease is a rare non-neoplastic lympho-proliferative disorder. First described by Castleman in 1954 in two patients who presented with mediastinal lymphadenopathy, the disease had histological characteristic of lymphoid follicular hyperplasia with regression of their germinal centres [5]. Later,

two histologically distinct subtypes were described, a Hyaline vascular type and a Plasma cell type while the Mixed type exhibited both these features. Although CD often presents clinically as a solitary nodal swelling (Unicentric Castleman's Disease), a Multicentric form was identified later which had different aetiology, clinical features and a much worse prognosis [6]. Unicentric Castleman's disease generally presents with mediastinal or cervical lymphadenopathy of long duration without Type B symptoms like fever or weight loss. There is no association with Human Herpes Virus 8 or HIV infections like in the multicentric CD [7]. Surgical excision alone is generally quite effective for Unicentric CD although a number of other treatment modalities have also been utilized with success like steroids, local radiation and chemotherapy [8]. Our patient underwent adjuvant radiation to the ipsilateral neck because of multiple nodal involvement after surgical excision and is disease free at 3 years.

Case 3: A 20 year old female presented with a small swelling over her left lower neck which had been present for several years. Recently she noticed a small increase in size along with mild pain. On evaluation by X-ray and MRI it was found to be a bony mass in close relation to the left first rib, of size about 4 cms diameter (Figure 2). FNAC was attempted from the mass but it was inconclusive. As the lesion was symptomatic and increasing in size, we excised it under GA. Intra-operatively, it was found to arise from the middle third of the left first rib. Segmental rib resection along with excision of the mass with adequate soft tissue margin was done. The histopathological report revealed a well differentiated chondrosarcoma arising in a pre-existing osteochondroma. The margins of excision were free from tumour infiltration. However, in view of less than optimum margins, she was treated with adjuvant radiation. Patient was disease free for about 3 years after which she was lost to follow up.

Discussion:

Chondrosarcomas are the second most common primary bone malignancy. However they arise most commonly from the pelvis and femur. They are more common in males and the peak age incidence is about forty years. They are usually primary but about ten percent arise from malignant degeneration of a pre-existing benign lesion like solitary osteochondroma or multiple exostosis (secondary chondrosarcoma) [9]. Chondrosarcomas commonly present with bone pain or a swelling. On imaging, the characteristic appearance of a central chondrosarcoma is a lytic lesion in a bone with irregular margins. There is variable amount of calcification within the lesion. Peripheral chondrosarcoma arise from the surface of bone and appear as exophytic masses with flocculent calcification. CT scans are the investigation of choice for chest wall sarcomas as the bone and soft tissue windows allow detailed evaluation of the extent of soft tissue mass and underlying bone destruction while the lung window documents pulmonary metastases[10].

Chondrosarcomas are relatively resistant to conventional chemotherapy or radiotherapy, the treatment of choice is surgical i.e. wide excision of the lesion. In a published series of thoracic chondrosarcoma from Mayo clinic, fifty percent of patients who had a local excision had a recurrence within ten years. Conversely, only seventeen percent of those patients who underwent wide excision (2 to 4 cm margin of surrounding normal tissue) had a local recurrence[11]. In a large published study of secondary chondrosarcoma from Mayo clinic, most were well differentiated[12]. Our patient also had a well differentiated tumour. Ribs as the primary site of occurrence for chondrosarcomas are very rare and the first rib was rarer still[13]. We could find only three isolated reports of resection of chondrosarcoma arising from the first rib. All of them are from Japan and in all cases they occurred in individuals over forty years of age [14]. Our patient is unique in that she was only twenty years old, a female and she had a secondary chondrosarcoma.

Case 4: A 35 year old male presented to us with a progressive painless swelling of the right neck, of more than 18 months duration. Initially it had started as an infra-auricular swelling but over the months it slowly progressed to reach almost up to the clavicle. For the last few months he had developed hoarseness of voice and difficulty in swallowing too. He had already undergone a FNAC outside which had reported it as a paraganglioma. On clinical examination, the swelling was about 10 x 6 cms, firm, with restricted mobility. The right vocal cord was fixed and right palate was paralyzed. Gag reflex was absent. MRI of head and neck revealed a heterogeneous intensity mass involving right IJV with areas of necrosis (Figure 3). There was no intracranial extension or involvement of the skull base. With a provisional diagnosis of Paraganglioma, the tumour was excised under general anaesthesia. During operation, the mass was seen to infiltrate the right IJV which had thrombosed totally right from its origin from the jugular foramen to its lowest part in the neck, just above the clavicle. The vagal branches and spinal accessory nerve were also involved by the mass and sacrificed. The post-operative period was uneventful. Final histopathology report came as extensive area of necrosis surrounded by palisading histiocytes, foamy macrophages and inflammatory cells along with some round, oval or polygonal cell with vesicular nuclei and ample eosinophilic cytoplasm. An infarcted tumour embolus was seen inside internal jugular vein. No diagnosis was possible on histopathology alone, so immunohistochemistry was done which revealed positivity for epithelial membrane antigen (EMA) and

Progesterone receptor and negative for Cytokeratin, Chromogranin A and S-100 protein. Based on the radiological picture, the histopathological findings and IHC, a diagnosis of extra-calvarial meningioma was made. There was no improvement in the neurodeficits after surgery. The patient is alive and recurrence free 1 year from the surgery.

Discussion:

Meningiomas are the most common benign intracranial neoplasms, arising from the arachnoid "cap" cells of the arachnoid villi in the meninges and it rarely extends extra-cranially [15]. Incidence of primary extra-cranial meningiomas is only about 1 %. Meningioma in the parapharyngeal space can be a direct extension of intracranial meningioma through skull base foramina, can arise de novo from the pluripotent mesenchymal cells or can arise from the meningocytic cellular rests in the sheaths of the cranial nerves[15].

The presenting features of extra-cranial meningioma in neck, reported in literatures were almost same – a gradually progressive painless swelling[16]. The present case was no exception. All the reported cases presented with different combinations of symptoms of different cranial nerve palsy especially CN IX – XII [16, 17].The present case had palsies of CN IX, CN X and CN XI. Observing the pattern of cranial nerve involvement, the possibility of origin at or near the Jugular foramen may be considered in the present case. But there was no radiological or per-operative evidence of any intracranial extension.

The tumour might have originated from the area near the jugular foramen and subsequently enlarged downward without any upward extension inside the cranial cavity. Several authors mention that FNAC may not be able to diagnose these cases. The present case was reported twice as paraganglioma on FNAC. CT scan and MRI were the mainstay of radiological evaluation in all the published cases and a variety of findings were reported. In some cases intracranial part of the tumour were detected either in continuity through the jugular foramen or with destruction of bone in the skull base[15, 18]. In some other cases there was no intracranial involvement [19]. Our patient did not have any radiological evidence of intra cranial involvement. The most unusual feature of our patient was the invasion of the Internal Jugular vein along its entire length by the tumour. Two case of meningioma in neck were reported by Kulkarni et al with encasement of carotid arteries[20].But we found no reference regarding complete engulfment of internal jugular vein by a neck meningioma.

Case 5: A 23 year old male presented with a progressive swelling of size 8 x 6 cms in the left lower neck of several months duration. It was firm and had restricted mobility. There were no other significant symptoms like pain or pressure symptoms. He had undergone a FNAC of the mass which had showed papillary adenocarcinoma. A primary lesion in GI tract was suggested. However, Upper GI endoscopy and flexible full length colonoscopy and CECT scan of abdomen failed to reveal any GI primary. During other investigations, serum Alpha Feto Protein and ß-HCG were found to be highly elevated. Hence after discussion with pathologist, a provisional diagnosis of extra-gonadal germ cell tumour was made as the testes were normal. He was treated with 4 cycles of BEP with partial response, the tumour shrinking to about 5 x 4 cms. Post chemotherapy CECT scan of the Thorax and Abdomen didn't reveal any other disease site. The tumour markers were also normal. So the residual mass was excised under GA. Final histopathology however came as metastatic deposits of mucin secreting adenocarcinoma. Immuno-histochemistry showed the tumour to be CK 7 and CK 20 negative. In the absence of any clinical or radiological evidence of GI or lung primary, the patient was treated as a Carcinoma of unknown primary site with cervical nodal metastases. The patient is free of recurrence at last follow up of 2 months

Discussion:

Extra-gonadal Germ cell tumours are found in the retro-peritoneum, mediastinum and rarely in the cervical region. Head neck germ cell tumours occur mostly in children and comprise less than 5% of all Germ Cell tumours [21]. Generally they are painless, slow growing masses. They are treated with a combination of chemotherapy and surgery, depending on the site of involvement. Our patient had received 4 cycles of chemotherapy and possibly the immature component of the tumour responded while the more differentiated component did not respond to chemotherapy and was left as the residual nodal mass. The other possibility is that it was a carcinoma of unknown primary site which could not be identified with the available investigations. Whole body PET- CT scan is of use in such cases for identifying some occult primary. Our patient was advised to undergo PET-CT scan but he could not afford it [22].

Case 6: A four year old female was brought to our OPD with complaint of a slowly progressive swelling in front of her neck, which according to her parents had been present almost from her neonatal period. Since she did not have any pain and the swelling was small, they had not got her evaluated. But there was a slow progression over the last year with overlying skin ulceration in the last few months, so they wanted treatment. On examination, the swelling was situated in the anterior neck almost occupying the entire middle third with superficial skin ulcer (Figure 4). It was well circumscribed, of variable consistency but mainly firm. It was not

pulsatile or compressible. It was not fixed to the larynx or trachea and did not move with deglutition. With a provisional diagnosis of soft tissue tumour, FNAC and later incision biopsy was done. The biopsy revealed proliferation of spindle cells at places admixed with vascular spaces and sprinkling of inflammatory cells. The likely diagnosis offered was a vasoformative tumour like haemangioma. The CECT scan of neck revealed a heterogeneous soft tissue mass with large areas of calcification but not much vascularity. The carotid sheaths were free bilaterally. Wide excision of the lesion was done and intra-operatively the lesion was found mainly in the subcutaneous space with infiltration of the deep fascia but no attachment to the deeper structures. The histopathology report was Infantile myofibroma. The child is recurrence free at last follow up.

Discussion:

Infantile myofibromas are rare, benign tumours which have a predilection for head and neck region although they have been reported to arise from all parts of the body[23]. Most cases occur in the orbital region. They may occasionally be multiple lesions, in which case the entity is called myofibromatosis. The tumours may be locally infiltrative. Most of them present within the first few months of life, some being reported at birth itself[24]. They are slow growing and symptom free when involving the subcutaneous tissue.Tumours situated intra-abdominally may cause vague pain. Histologically, they have a biphasic appearance with two different cell types seen. One is a plump spindle cell like a myo-fibroblast and the other cell type is a small round blue cell [25]. The arrangement of the spindle cells is in bundles or fascicles within a collagen stroma. Liberal thin walled vascular spaces are also present. Other features that are seen include haemorrhage, necrosis and calcification as well as invasion of the vascular spaces[26]. On IHC, all the cells show positivity to Vimentin and the spindle cells are usually strongly positive for SMA. Other muscle specific markers like Desmin or neuronal markers are usually negative [27]. Treatment is surgical excision with free margins. Local recurrence may occur occasionally. Interestingly, isolated myofibromas may sometimes regress spontaneously. The treatment of the diffuse form involving multiple viscera is much more complex and associated with a poorer outcome [28].

Figures. 4.1

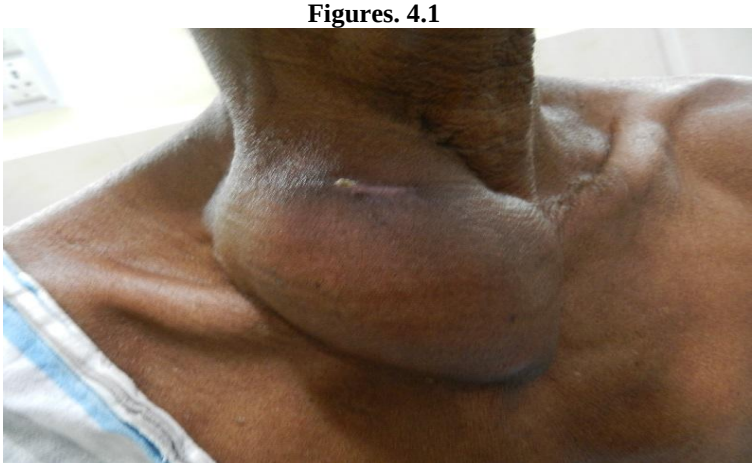

Figure 1. Fluctuant neck swelling over anterior part of neck on the right, adherent to sterno-clavicular joint.

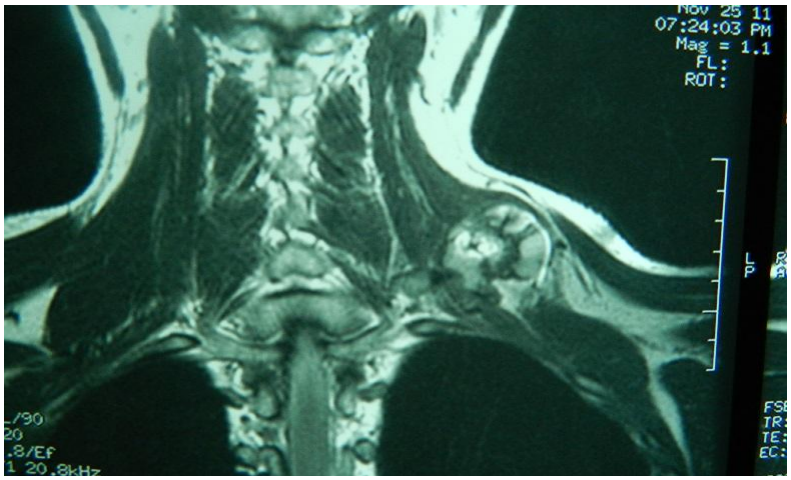

Figure 2. T2 weighted MRI showing heterogeneous signal intensity lesion arising from left first rib.

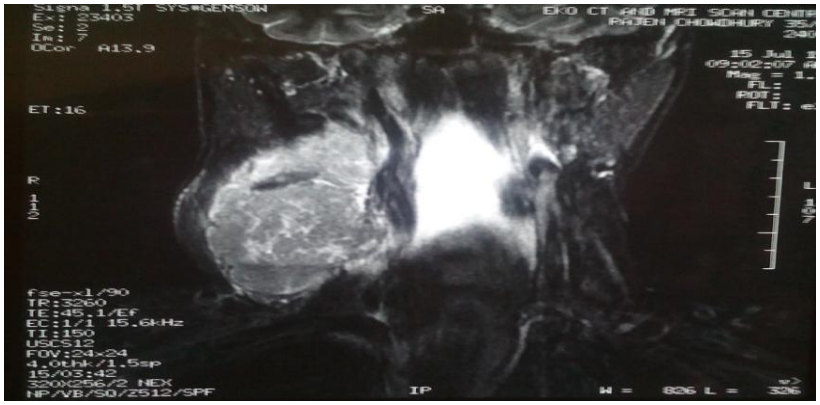

Figure 3. Mri Stir sequence showing right sided neck mass with involvement of right Internal Jugular vein.

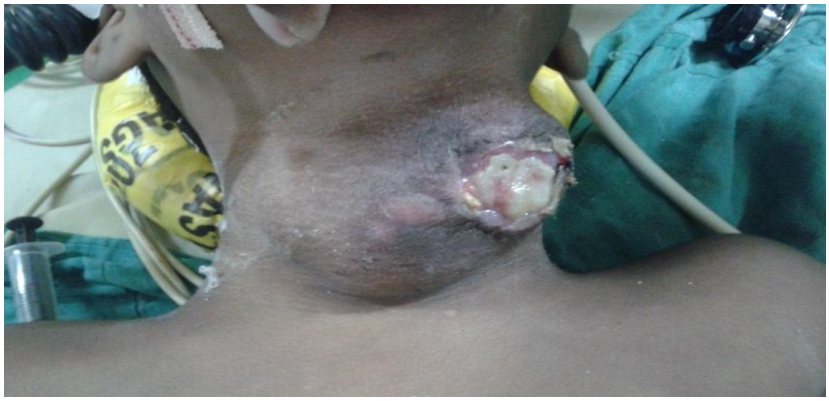

Figure 4. Firm neck swelling with areas of necrosis in a 4 year old child.

IV. Conclusions

Neck swellings are of various aetiology. Rare conditions are rarely diagnosed before operation on scanty tissue material, whether cytology or incision biopsy. FNAC is normally the first investigation for the diagnosis of a neck swelling but in our study, FNAC failed to diagnose the aetiology of any of the neck masses. The key to management of these swellings, where incision biopsy is inconclusive, is to go for complete surgical excision whenever feasible. Repeat FNAC or even small biopsies may not yield results as these lesions are extremely rare and have a complex histological picture with partial overlap with other commoner conditions. Decision about resectability is best achieved by a contrast enhanced CT scan or MRI. With a detailed history and sufficient tissue for histological examination, the diagnosis is achieved in most cases. Immuno-histochemistry is also useful in confirming the diagnosis of these rare conditions. The results of complete surgical excision is quite gratifying with long term control and even cure of these lesions.

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