



ORIGINAL RESEARCH PAPER

Otolaryngology

EVALUATION AND MANAGEMENT OF CYSTIC SWELLINGS OF NECK IN A TERTIARY CARE HOSPITAL- CASE STUDY

KEY WORDS: Cystic swelling; Neck; Fine Needle Aspiration cytology(FNAC); Ultrasonography.

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ABSTRACT

A number of masses may develop in the neck and these may also be called swellings, growths, tumors and lumps. Cystic swellings in the neck are one of those that arise from a diverse range of tissues and pathological disorder. The aim of the study is diagnosis and management of various cystic swellings out of all head and neck swellings and describing their age and sex incidence, site of origin and tissue components, diagnostic methods and various treatment options.

INTRODUCTION

A variety of disease processes may affect head and neck regions, which present clinically as swellings. The disease processes which lead to such type of swellings can be broadly classified as inflammatory, cystic, benign or malignant in nature. Cystic swellings of neck include a wide range of congenital and acquired lesions. Congenital masses in the neck include branchial cleft cysts, thyroglossal duct cysts (TGDCs), ectopic thymus cysts, dermoid and epidermoid cysts, cystic vascular abnormalities, and lymphatic malformations. Other cystic lesions in the differential diagnosis include cystic metastatic lymphnode, cystic schwannomas, chronic inflammation, abscess formation, deep-seated or infected cystic lesion and laryngocele. Although clinical history and examination may suggest the diagnosis, imaging & FNAC is required to confirm the clinical diagnosis and assess the anatomical extent of the lesion before treatment.

High-resolution ultrasound (US) is an ideal initial imaging investigation for neck masses. Computed tomography (CT) is superior to USG as it determines the extent of lesion, and is especially useful in demonstration of calcification or fat within the lesion. T2-weighted MRI particularly helps to distinguish cystic from solid components. Fine-needle aspiration cytology (FNAC) may be required for confirmation of diagnosis. Definite treatment is surgical excision or conservative medical management.

MATERIALS & METHODS

This study presents a retrospective analysis of 200 patients presenting with a neck swelling from January 2015 to January 2016. Out of 200 cases, 100 were cystic swellings of neck. Patient records were reviewed for demographic analysis, clinical and radiological assessment, and surgical interventions and histopathology. The study was approved by our institutional ethical committee. Patients were informed about the procedures and written consent forms were obtained. Inclusion criteria: clinically obvious cystic neck swellings. Exclusion Criteria: (1) swellings (hematoma) owing to trauma or fracture were not included because it occurs due to changes in skin colour and mucous membrane and there is history of trauma, (2) Swellings of deep lobe of parotid obscured by ramus of mandible and not seen on ultrasonography. (3) Firm to hard neck swellings

History of patients was taken. Clinical examination of swelling was done followed by FNAC, imaging and histopathology examination of postoperative specimen of neck swelling. Clinical Examination includes inspection-colour, shape, size, location, border, surface, overlying skin over the swelling and palpation- consistency, mobility, tenderness, temperature, fluctuation, compressibility and fixity of skin over the swelling, which were recorded and a provisional diagnosis was made. Ultrasonography is the first radiological imaging method that was advised followed by Fine

Needle Aspiration Cytology. In selective cases, CT scan & MRI was also advised. Following clinical, FNAC, ultrasonography findings surgical intervention was carried out. Incision & drainage was done in those cases of inflammatory or suppurative lesions that did not respond to antibiotics. Complete surgical excision with histopathological study of specimen is advised in some cystic lesions. Other options are no intervention or observation for those patients who have co-morbidities, no functional or cosmetic impairment and refusing for surgery. All the data obtained were tabulated and analysed.

RESULTS

The study included 100 cases of cystic swellings with age range from 1 to 70 years. Out of these 40 cases 42% were male and 58% were female. Male to female ratio was 1:1.4. (Table-1) Maximum incidence was observed in the age group of 1 to 30 years.

TABLE-1: AGE & SEX INCIDENCE

| AGE (YEARS) | No. of patients | Percentage (%) |
|-----------------------------|-----------------|-----------------------------|
| 0-10 | 8 | 8 |
| 10-20 | 18 | 18 |
| 20-30 | 30 | 30 |
| 30-40 | 10 | 10 |
| 40-50 | 18 | 18 |
| >50 | 16 | 16 |
| GENDER (MALE/FEMALE) | 42/58 | 42/ 58 (RATIO=1:1.4) |

In our study 70% lesions were midline, 30 % were lateral which was comparable to study by Al-Khateeb Th et al & Darshan Goyal (Table-2)

TABLE-2: LOCATION OF CYSTIC LESIONS

| Location | No. of patients | Percentage | Study by Al-Khateeb TH et al. | Study by Darshan Goyal |
|-----------------------|-----------------|------------|-------------------------------|------------------------|
| Lateral neck swelling | 70 | 70 | 66 | 75 |
| Midline neck swelling | 30 | 30 | 22 | 25 |
| Entire neck mass | 0 | 0 | 12 | 0 |

Thyroglossal cyst involvement (25%) was more common than other lesion. Incidences of Epidermoid cyst were 12% while dermoid cyst was present in 15% of patients.(Table-3)The least common lesions were plunging ranula, abscess, laryngocele,

hydatid cyst, cystic metastatic node.

TABLE-3: TYPE OF CYSTIC SWELLINGS

| Type of Lesion | No. of patients | Percentage |
|--|-----------------|------------|
| Thyroglossal duct cysts | 28 | 28 |
| Branchial cysts | 10 | 10 |
| Lymphatic cysts/cystic hygroma | 8 | 8 |
| Epidermoid cyst | 12 | 12 |
| Dermoid cyst | 10 | 10 |
| Vascular malformations | 6 | 6 |
| Inflammatory lesions/suppurative lesions | 12 | 12 |
| Hydatid cyst of submandibular region | 1 | 1 |
| Cystic metastatic cervical lymphnode | 7 | 7 |
| Laryngocele | 4 | 4 |
| Plunging ranula | 2 | 2 |

76% were congenital lesions and 24 % were acquired ones (Table-4)

TABLE-4: ORIGIN OF LESION

| Origin | Percentage |
|------------|------------|
| Congenital | 76 |
| Acquired | 24 |

80% of cases presented as nontender neck mass while rest were symptomatic (Table-5)

TABLE-5: CLINICAL PRESENTATION

| Clinical Presentation | No. of Patients | Percentage |
|--------------------------|-----------------|------------|
| Painless neck swelling | 80 | 80 |
| Tenderness | 6 | 6 |
| Fever | 5 | 5 |
| Cervical lymphadenopathy | 4 | 4 |
| Change in voice | 3 | 3 |
| Respiratory difficulty | 3 | 3 |
| Referred Otalgia | 2 | 2 |
| Anoerexia | 6 | 6 |
| Weight loss | 4 | 4 |

Majority of lesions were having well defined clear boundaries (60%), round shape (52%), hypoechoic (44%) & homogenous(76%)(Table-6)

TABLE-6: ULTRASONOGRAPHIC FEATURES

| Ultrasonographic features | No. of Patients | Percentage |
|---------------------------|-----------------|------------|
| Boundaries | | |
| 1. Very Clear | | |
| 2. Relatively Clear | 60 | 60 |
| 3. Partially Clear | 16 | 16 |
| 4. Ill-defined | 0 | 0 |
| | 24 | 24 |
| Shape | | |
| 1. Oval | 20 | 20 |
| 2. Polygonal | 0 | 0 |
| 3. Lobular | 12 | 12 |
| 4. Irregular | 16 | 16 |
| 5. Round | 52 | 52 |

| Echo-intensity | | |
|------------------|----|----|
| 1. Anechoic | 20 | 20 |
| 2. Hypoechoic | 44 | 44 |
| 3. Isoechoic | 0 | 0 |
| 4. Hyperechoic | 24 | 24 |
| 5. Mixed | 12 | 12 |
| USG architecture | | |
| 1. Homogenous | 76 | 76 |
| 2. Heterogenous | 24 | 24 |

The different management options are mentioned in Table-7

TABLE-7: MANAGEMENT

| Treatment Options | No. of Patients | Percentage |
|----------------------------------|-----------------|------------|
| 1. Complete excision with biopsy | 74 | 74 |
| 2. Incision & Drainage | 7 | 7 |
| 3. Medical management | 11 | 11 |
| 4. Incisional biopsy | 3 | 3 |
| 5. No Intervention | 5 | 5 |

DISCUSSION

Cystic lesions of the head and neck include congenital, developmental, inflammatory, and vascular lesions.^[1] While these lesions may appear similar on computed tomography (CT) and magnetic resonance imaging (MRI) scans, their characteristic locations—midline or laterally, suprahyoid or infrahyoid, deep or superficial—may suggest a specific diagnosis. Complete assessment of cystic masses is done from detailed case history, clinical examination and radiological investigations.^[2,3] Clinical course of a cyst is usually mild with no significant problems. Physical examination generally reveals the presence of an elastic painless tumor, gradually increasing in size and located in typical position.

Branchial cleft cysts

Branchial anomalies represent 30% of all congenital neck lesions. Branchial cleft anomalies can manifest as cysts (75%) or fistula or sinus tracts (25%), but they also include rarely thymic cysts, aberrant parathyroid tissue, and parathyroid cysts.^[4] First branchial cleft cysts are less common and present with recurrent or refractory abscesses in the periauricular or parotid region, or at the angle of the mandible. (Fig.1) Second branchial anomalies comprise 95% of all branchial cleft lesions, most commonly presenting as cystic masses rather than sinuses or fistulas.^[5] Second branchial cleft cysts are most commonly found at the angle of the mandible along the anteromedial border of the sternocleidomastoid muscle, but can occur anywhere from the oropharyngeal tonsillar fossa to the supraclavicular neck.^[6] On CT, these lesions are typically well-circumscribed, homogeneously hypoattenuating, unilocular cystic lesions, while on MRI, branchial cleft cysts are hypointense on T1 and hyperintense on T2. Third branchial cleft anomalies lie superior to the superior laryngeal nerve, while fourth branchial anomalies lie below.^[7] Third branchial cleft cysts are typically located posterior to the common carotid or internal carotid artery and sternocleidomastoid (within the posterior cervical triangle), superior to the hypoglossal nerve, and inferior to the glossopharyngeal nerve. The definitive treatment is surgical excision.(Fig 2,3)

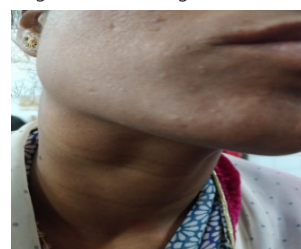


Fig.1 Branchial cyst of right cervical region

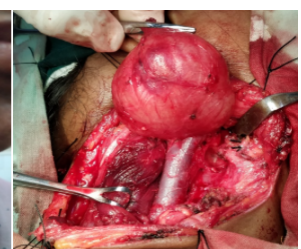


Fig.2 Intraoperative picture cervical region

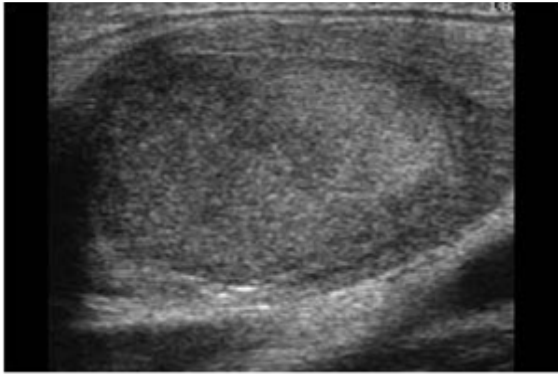


Fig.3 Branchial cleft cyst anterior to the carotid and showing internal echoes

Epidermoid and dermoid cysts

Dermoid and epidermoid cysts may occur anywhere in the body, with 7% presenting as head-and-neck lesions like submandibular or sublingual space.^{15, 8)} Dermoid cysts are lined by the epithelium and differ from epidermoid cysts in that they contain skin appendages such as sebaceous glands and hair follicles, mesodermal elements like cartilage, bone, and fat within the cyst wall. (Fig 4, 5) On non-contrast CT, dermoid cyst usually appears as a low-density, unilocular, well-circumscribed mass. Fat, mixed-density fluid, and calcification (<50%) may also be seen. Coalescence of fat into small nodules within the cystic lesion, giving a "sac-of-marbles" appearance. Most dermoid cysts are located superior to the mylohyoid muscle. Approximately 11.5% of dermoid cysts are located in the midline of the floor of the mouth or within the oral tongue.¹⁹⁾ (Fig.6, 7, 8, 9)



Fig.4 Epidermoid cyst of neck

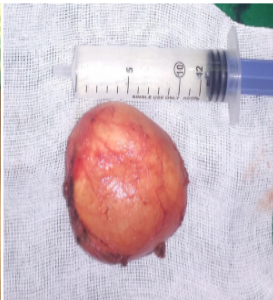


Fig.5 Cystic mass



Fig. 6 Dermoid cyst

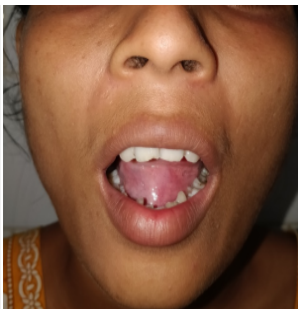


Fig.7 Dermoid cyst in floor of mouth

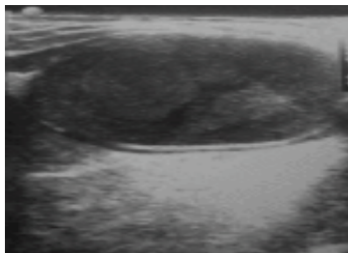


Fig.8 USG showing heterogenous lesion



Fig. 9 intraoperative image

Thyroglossal duct cysts

Thyroglossal duct cysts (TGDC) represent 70% of all congenital neck masses. TGDC can extend through or around the hyoid bone. The Sistrunk procedure is performed for removal of TGDC, in which the cyst, the entire thyroglossal tract, and the central hyoid bone are removed. Seventy-five percent of TGDCs occur in the midline, while 25% are within 2 cm of midline in the anterior neck. 15% occur at the level of the hyoid bone, while 60% occur just inferior to the hyoid, embedded within the strap muscles. (Fig.10)

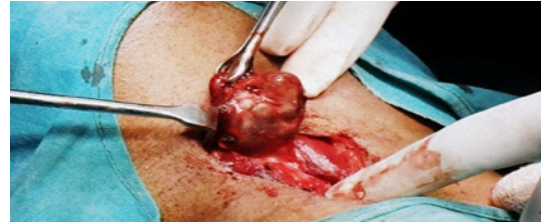


Fig. 10 Sistrunk operation for thyroglossal duct cyst

Lymphatic Malformations

Lymphatic vascular malformations are developmental anomalies of the lymphatic system that can occur anywhere in the body, but 75% affect the head and neck most commonly along the jugular chain.¹²⁾ Lymphangiomas of the head and neck most commonly occur in the posterior cervical triangle followed by the axilla, submandibular space and the tongue musculature. Four types of lymphangioma are described based on microscopic size of dilated lymphatic channels-cystic hygroma, cavernous lymphangioma, capillary lymphangioma, and vasculolymphatic malformation.¹⁹⁾ Cystic hygromas are the most common form of lymphangioma. These lesions are characteristically infiltrative in nature and do not respect facial planes. The mediastinum and axilla are common sites of their extension.¹⁴⁾

On US, these appear as multi-locular cystic masses, with septations of variable thickness. CT shows these as poorly circumscribed, multi-loculated, hypodense masses with fluid attenuation. MRI helps in delineating the extent of the lesion, will show a unilocular or multilocular cystic lesion in the left supraclavicular fossa with possible retrosternal extension. Lymphangiography (the gold standard exam) or lymphoscintigraphy can be performed to confirm communication with the thoracic duct. Asymptomatic lesions can be treated conservatively, but in the symptomatic setting surgical resection with thoracic duct ligation or cyst aspiration with sclerosant injection can be performed.¹⁵⁾



Fig.11 Cystic hygroma of neck



Fig.12 intraoperative image



Fig.13 Lymphangioma of neck



Fig.14 CT scan Image

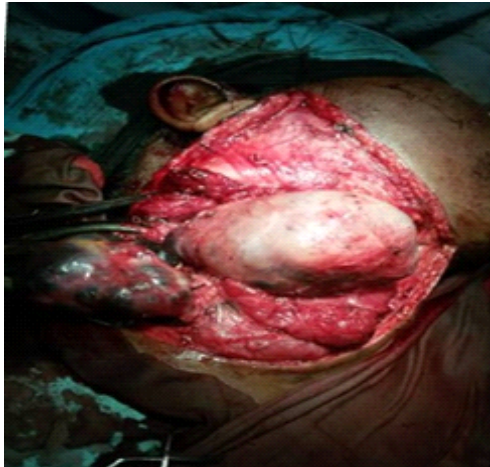


Fig.15 Intraoperative picture

Laryngocele

A laryngocele is considered to have a congenital derivation, although it usually manifests in adults.^[5] It is dilatation of a small pouch arising from the roof of the ventricle i.e saccule.^[16] Laryngoceles are of three types—internal, external, and mixed in relation to thyrohyoid membrane. Fifteen percent of laryngoceles are associated with carcinoma,with tumor occluding the orifice of the laryngeal ventricle.^[17] A sharply defined oval or round lucent area in the para-laryngeal soft tissues on a radiograph is diagnostic of laryngocele. Demonstration of a connection between the air sac and the airway confirms the diagnosis.

Ranula

Ranulas represent cystic lesions of the floor of the mouth occurring due to obstruction of the sublingual duct. These are also called sublingual gland mucocele or mucous retention cyst. Ranulas may be either "simple" or confined to the sublingual space or "plunging/diving," which extend posteriorly into the sub-mandibular space or through a mylohyoid defect.^[18] Rarely ranulas can dissect across the midline between the mylohyoid and geniohyoid muscles to present as a bilateral mass. On USG, a ranula appears as a unilocular, well-defined, cystic lesion in the sub-mental region deep to the mylohyoid muscle. (Fig.16, 17)

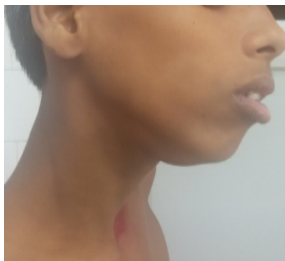


Fig16. Plunging Ranula



Fig. 17 Bluish swelling in floor of mouth

Other uncommon cyst like swellings includes metastatic nodes from papillary carcinoma of the thyroid are the most common types of nodal metastases presenting as cystic masses in the neck.^[19] Rarely vascular lesions (pseudoaneurysm, arteriovenous fistula/malformation, venous vascular malformation, and phlebectasia) may appear as cystic masses in the neck. Various infections and inflammatory lesions in the neck region manifesting as cyst-like masses are adenitis, abscesses, acute suppurative thyroiditis, and cellulitis. Various types of congenital/developmental cysts are lymphoepithelial cysts, BCCs, epidermoid cysts, polycystic disease, congenital sialectasis, and Merkel's cyst. Acquired cysts are sialocysts, pneumoceles, AIDS-related parotid cysts, ranula, and cystic tumors of the salivary gland. [20] We had encountered a rare case of hydatid cyst of submandibular region. (Fig. 18, 19)



Fig.18 Hydatid cyst of It submandibular gland



Fig.19 Cystic mass

Indications for surgery are chiefly based on clinical condition of the patient presenting with evident lateral or median cyst of the neck. Surgical procedure usually consists of radical resection of the cysts together with existing fistulas. If concomitant lesions are diagnosed within thyroid gland, the surgeon may decide to resect the goitre and thyroid pyramidal lobe by one-stage procedure. If the cyst is accompanied by inflammatory process and an abscess, the surgery may consist of incision, inoculation and drainage with antibiotic therapy and excision at a later stage.

CONCLUSION

Clinical presentation along with imaging features such as anatomical location, extent, internal composition, vascularity as assessed by Doppler US, or contrast enhancement on CT help in accurate diagnosis. Radical resection of the cysts is the definite treatment to prevent recurrence.

FINANCIAL OR OTHER COMPETING INTERESTS: None

CONFLICT OF INTRESTS: None

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