

Original Article

Midline Neck Swellings - Frequency of Occurrence of Thyroglossal Cyst

1. Quddus-ur-Rehman 2. Irfan Ahmed Mughal 3. Asim Elahi

1. Assoc. Prof. of Anatomy 2. Prof. of Anatomy 3. Demonstrator, Independent Medical College, Faisalabad

ABSTRACT

Aims and objectives-To study the frequency of occurrence of thyroglossal duct cyst in comparison to other midline neck swellings.

Study Design: It is a prospective descriptive study.

Place and Duration of Study: It is conducted in SUI in Allied hospital Faisalabad from March 2006 to March 2008.

Materials and Methods: In this study 35 patients were studied. They were admitted through outdoor to surgical unit I with midline neck swellings. Patients of both sexes from 5 to 45 years old were examined. Their detailed history and physical examination were carried out. It was determined on physical examination that the midline swellings were solid or cystic, tender or non tender and moved with swallowing and tongue protrusion or not.

Inclusion criteria: All patients with central midline swellings of the neck.

Exclusion criteria: Patients with lateral neck swellings were excluded from this study.

Results: In our study of 35 patients of midline neck swellings, 21 were males and 14 were females. Out of 35 patients 20 patients(57.14%) were having acute or chronic lymphadenitis, One out of 35 patients had Hodgkin's lymphoma(2.85%),3 patients (8.5%) had thyroglossal cysts,8 patients(22.85%)had solitary thyroid nodule of isthmus,2 patients(5.7%)were suffering from dermoid cyst while 1 patient(2.8%) had plunging ranula. Out of 3 patients of thyroglossal cysts 2(5.71%) were males and 1(2.85%) was female. The age range was between 5 to 45 years.

Conclusion: Lymph node enlargement are among the most common causes of midline neck swellings. Thyroglossal cysts are also found among the midline neck swellings but not as frequently as solitary thyroid nodules of the isthmus. Dermoid cysts and plunging ranulas are quite rare causes of midline neck swellings.

Key Words: Midline neck swellings, thyroglossal duct cyst, lymphadenitis, solitary thyroid nodule of isthmus, Dermoid cyst, Plunging ranula.

INTRODUCTION

Midline swellings in the neck are congenital, inflammatory or neoplastic in nature. Amongst the congenital swellings thyroglossal cysts are quite common^{1,2,3}. Other midline swellings which can be considered as the differential diagnosis of thyroglossal cysts are plunging Ranula, dermoid cyst, teratoma, thymic cysts, midline ectopic thyroid gland, enlarged isthmus of thyroid gland (solitary thyroid nodule), lymphadenitis or lymphangioma. While making a diagnosis of thyroglossal cyst it is desirable to keep in mind that these swellings are not always in the midline, being on one side or the other in the neck on some rare occasion probably because of infection or some branching remnants⁴. It is desirable to excise these swellings because of their tendency to get infected or rarely to become malignant (1%) particularly in female patients. Sometimes these swellings after getting infected transform into an abscess which may later discharge on a surface leading to a sinus formation.

Thyroid gland develops from thyroglossal duct which descends to its anatomic position from foramen caecum present at the junction of anterior two third and

posterior one third of the tongue. During its descent it either passes anterior or posterior or through the hyoid bone. Remnants of thyroglossal tract along its path of descent may lead to presence of thyroglossal duct cysts located at different positions like intraglossal, submental, suprahyoid, infrahyoid, at thyroid cartilage, at cricoids cartilage or suprasternal position.⁵ Thyroglossal cysts occur in infants, children and young adults. However, they can occur in elderly patients as well⁶. These cysts can fill with fluid or mucus, and may enlarge if they become infected. Very enlarged cysts can cause difficulty in swallowing or obstruct breathing passages⁶.

The thyroid gland is a midline derivative of the pharynx. It is first identifiable in embryos of approximately 20 somites as a median thickening of endoderm lying in the floor of the pharynx between the first and second pharyngeal pouches and immediately dorsal to the aortic sac. This area is later invaginated to form a median diverticulum which appears late in the fourth week in the furrow immediately caudal to the median tongue bud. It grows caudally as a tubular duct. The tip of the duct bifurcates from which the isthmus

and the lateral lobes of the thyroid gland are developed. The median diverticulum is connected to the pharynx by the thyroglossal duct. The site of its initial connection with the endodermal floor of the mouth is marked by the foramen caecum, whence it extends caudally in the midline ventral to the primordium of the hyoid bone (behind which it later forms a recurrent loop). The distal part of the duct may differentiate into the pyramidal lobe and levator muscle – or suspensory fibrous band – of the thyroid. The remainder becomes fragmented and disappears, although the lingual part is often identifiable until late in fetal life. Occasionally, parts of the midline thyroglossal duct persist and may occur in lingual, suprahyoid, retrohyoid or infrahyoid positions. They may form aberrant masses of thyroid tissue, cysts, fistulae or sinuses, usually in the midline^{24,25}.

The following are the most common symptoms of a thyroglossal duct cyst. However, each patient may experience symptoms differently. Symptoms may include:

- a small, soft, round and non tender mass in the front of the neck
- tenderness, redness, and swelling of the mass, if infected
- a small opening in the skin near the mass, with drainage of mucus from the cyst
- difficulty in swallowing or breathing

Generally, diagnosis is made by physical examination. The mass typically moves upward when the tongue is extended and with swallowing since the thyroglossal duct often connects at the base of the tongue. It is important to determine if the thyroglossal duct cyst contains thyroid tissues. In addition to a complete medical history and physical examination, diagnostic procedures for a thyroglossal duct cyst may include the following:

- blood tests (to assess thyroid function)
- ultrasound examination - To differentiate between a solid and a cystic swelling.
- thyroid scans - a procedure that uses radioactive iodine or technetium (a radioactive metallic element) to reveal any physical abnormalities of the thyroid and to know that the swelling is the only thyroid tissue present ectopically.

Treatment may include:

- antibiotic medication (to treat the infection)

Surgical removal of the cyst and the thyroglossal duct, called the Sistrunk procedure. Infection of the cyst prior to surgery can make the removal more difficult and increase the chance for regrowth. Body of hyoid bone and core of lingual tissue alongwith thyroglossal duct cyst is removed in Sistrunk operation to avoid any recurrence in future.

The recurrence rate associated with simple excision of a thyroglossal duct cyst is approximately 50%, whereas the recurrence rate associated with a formal Sistrunk procedure is approximately 5%. The rate of recurrence after a Sistrunk procedure is increased however, when a thyroglossal duct cyst is ruptured during dissection. A history of previous infection of the cyst, previous incision and drainage procedures, and adherence of the cyst to the skin all increase the risk of rupture during dissection. If the cyst is infected at the time of diagnosis, treatment with antibiotics, such as ampicillin/sulbactam, amoxicillin/clavulanate, or clindamycin, is indicated before surgical excision^{1,2,3}.

The most common complications of thyroglossal duct cysts are infection with the possibility for abscess formation, spontaneous rupture, and formation of a secondary sinus tract. A Sistrunk procedure mistakenly performed for thyroid ectopia that removes thyroid tissue can cause hypothyroidism. The cysts can compress the trachea and lead to respiratory distress, especially if they are rapidly expanding (although this is not common). Carcinoma is the most feared complication, occurring in about 1% of all cases, with papillary carcinoma accounting for 85-92% of malignancies and follicular carcinoma accounting for the rest. Most patients who develop carcinoma tend to present at a later age. Cancer in a thyroglossal duct cyst seems to be more common in females than in males. The diagnosis of carcinoma arising in a thyroglossal duct cyst is typically made postoperatively by histology⁷.

The majority of cystic neck masses in children are congenital. When midline or paramidline in position, thyroglossal duct cyst and dermoid cyst are the primary differential considerations. When off midline, branchial apparatus cysts and lymphatic malformations should be considered. Based on location and appearance, the majority of branchial apparatus cysts can be differentiated from lymphatic malformations.

The Delphian node (prelaryngeal) along with paratracheal nodes, pretracheal nodes, perithyroidal nodes make up level VI and not routinely excised in radical neck dissection. Involvement of this node can be as a result of diffuse nodal involvement in squamous cell carcinoma of the Head and Neck or in isolation from direct lymphatic spread of laryngeal cancer through the anterior commissure. Thyroid carcinomas may also involve this node.

The delphian node gains its name from the Oracle of Delphi, whose prophecy in this case would be of an unpleasant death secondary to laryngeal cancer. Plunging ranula is a cystic swelling having mucus secretion with connection to sublingual gland and may penetrate through myelohyoid muscle and present in submandibular regions⁸.

The neck is also divided into six lymph node levels each draining specific anatomical sites of the head and neck and are as follows:

Level 1 – Submental and submandibular nodes.

Level 2 – Upper jugular nodes – located anterior to sternocleidomastoid muscle, spanning from skull base to the level of the carotid bifurcation.

Level 3 – Mid jugular chain - located along internal jugular vein from the level of the carotid bifurcation to the level of the inferior belly of the omohyoid muscle.

Level 4 – Lower jugular chain – located along the lower jugular vein from the level of the inferior belly of the omohyoid muscle down to the clavicle.

Level 5 – Nodes located in the posterior triangle posterior to the sternocleidomastoid muscle.

Level 6 – Nodes are located in the midline anterior neck.

Aims and Objectives

To study the frequency of occurrence of thyroglossal duct cyst in comparison to other midline neck swellings

MATERIALS AND METHODS

In this study 35 patients were studied. They were admitted through outdoor to surgical unit I with midline neck swellings. Patients of both sexes from 5 to 45 years were examined. Their detailed history and physical examination were carried out. It was determined on physical examination that the midline swelling was solid or cystic, tender or non tender and moved with swallowing and tongue protrusion or not.

Study design: It is a prospective descriptive study conducted in SUI of Allied hospital Faisalabad from March 2006 to March 2008.

Inclusion criteria: All patients with central midline swellings of the neck.

Exclusion criteria: Patients with lateral neck swellings were excluded from this study.

After detailed history and physical examination of the patient provisional diagnosis was made and then relevant investigations were advised to the patients. These investigations included CBC, ultrasound of the

neck, thyroid scan, thyroid function test, FNAC and CT scan of neck.

After reaching the diagnosis definitive treatment whether surgical or medical were carried out. After surgery biopsies were sent for histopathology and diagnosis were further confirmed. After getting the desired data incidence of thyroglossal cyst was compared with other midline neck masses. Patients with acute lymphadenitis were treated by giving them antibiotics. Patients with tuberculous lymphadenitis were put on antituberculous therapy after confirming the diagnosis by excisional biopsy and histopathology of enlarged lymph node. While patients having thyroglossal cyst underwent Sistrunk procedure. In case of dermoid cysts excision was carried out. In case of plunging ranula excision of cyst alongwith removal of sublingual gland was undertaken. Patients with hodgkin's lymphomas were referred to oncology ward for chemotherapy and radiotherapy.

RESULTS

In our study 35 patients were included with midline neck swellings with age range from 5 years to 45 years. All patients with lateral neck swellings were excluded from our study. Out of 35 patients 21 were males and 14 were females.

It is evident from table No. I that out of 35 patients 20 patients(57.14%) were having acute or chronic lymphadenitis, One out of 35 patients had Hodgkin's lymphoma(2.85%),3 patients (8.5%) had thyroglossal cysts,8 patients(22.85%)had solitary thyroid nodule of isthmus,2 patients(5.7%) were suffering from dermoid cyst while 1 patient(2.8%) had plunging ranula. Out of 3 patients of thyroglossal cyst 2(5.71%) were males and 1(2.85%) was female. The age range was between 5 to 45 years.

As can be seen from above table patients with acute lymphadenitis are young patients with age range from 5 to 12 years. Out of 21 patients of enlarged lymph nodes in midline of neck 12 were males (57.14%) and 9(42.85%) were females. There were 12 patients of acute lymphadenitis (57.14%),8 were of tuberculous lymphadenitis(38%) and one patient of Hodgkin's lymphoma out of 21 patients of enlarged lymph nodes(4.7%)

Table No.1

Diseases	No. of Patients	Males	Age range	Females	Age range
Acute or chronic lymphadenitis	20	12	5-35 years	8	6-32 years
Hodgkin's lymphoma	1	1	36 years	-	-
Thyroglossal cysts/sinus	3	2	6-20 years	1	10 years
Solitary thyroid nodule of isthmus of thyroid gland	8	3	35-45 years	5	35-40 years
Dermoid cyst	2	2	20-31 years	-	-
Plunging ranula	1	1	10 years	-	-
Total	35	21	5-45 years	14	6-40 years

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Figure No.1: No. of patients with midline neck swellings

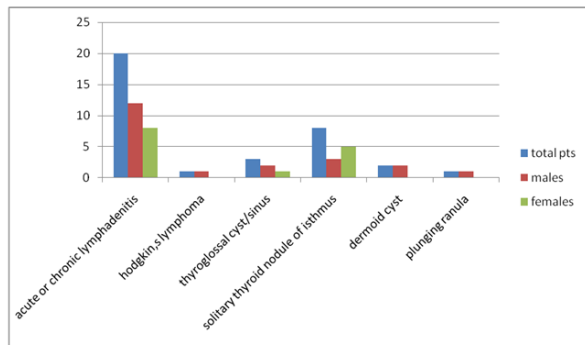
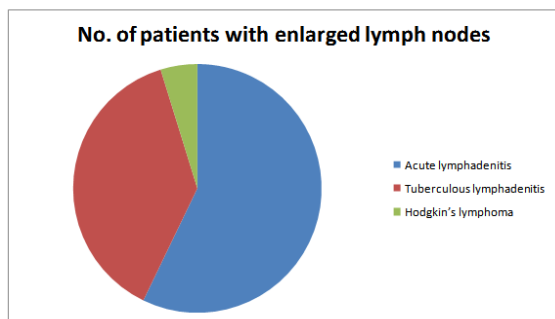


Table No. 2

Disease	No. of patients	Males	Age range	Females	Age range
Acute lymphadenitis	12	6	5-10 years	6	6-12 years
Tuberculous lymphadenitis	8	5	17-35 years	3	20-32 years
Hodgkin’s lymphoma	1	1	40 years	-	-
Total	21	12	5-35 years	9	6-32 years

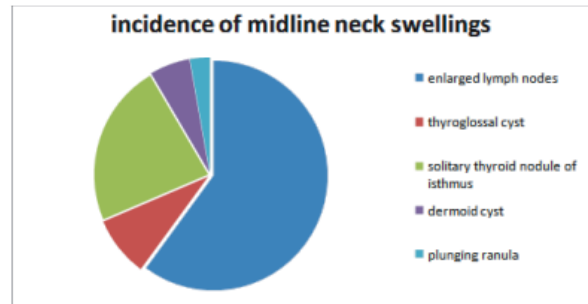
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Figure No.2



Out of 35 patients, percentage of patients with acute lymphadenitis is 34.28%,with tuberculous lymphadenitis it is 22.85% and with hodgkin’s lymphoma it is 2.85%.It can be seen from above tables that most common midline neck swellings are because of enlarged lymph nodes(60%)the second most common cause of midline neck swellings is solitary thyroid nodule of isthmus (22.85%) then comes thyroglossal cyst 8.5%,then dermoid cyst 5.7% and then plunging ranula 2.8%.

Figure No.3



DISCUSSION

In our study acute and chronic lymphadenitis are among the most common causes of midline neck swellings (57.14%).

Acute lymphadenitis is quite common among children either viral or bacterial and can be treated by medicines. Lymph nodes are painful and tender .In our study most of the patients with acute lymphadenitis are children between 5-12 years of age. Out of 35 patients 12 were having acute lymphadenitis(34.28%) which is quite close to other studies like Larsson et al⁹.In this study incidence of lymphadenopathy among children varies between 38-45%^{9,10}.The second most common cause of midline neck swellings in our study is tuberculous lymphadenitis i.e. 8 out of 35 patients were having cervical tuberculous lymphadenitis(22.85%).The frequency of occurrence of tuberculous lymphadenitis among the enlarged cervical lymph nodes in our study is 38%.It is comparable to other studies conducted in the other parts of the world^{11,12}.Enlargement of cervical lymph nodes because of Hodgkin,s Lymphoma is less common (2.85%) as compared to acute or tuberculous lymphadenitis.

This is comparable to other studies conducted in Pakistan and india.^{13,14} Most cases of thyroglossal cyst become apparent during the first decade of life. Although it is regarded as a lesion of the young, thyroglossal cyst may be encountered in adults, as found in some of our cases.¹⁵In our study 3 out of 35 patients of midline neck swellings(8.5%) were having thyroglossal cysts which are comparaple to other studies like Kurt A, Ortug C et al.^{16,17}Thyroglossal

cysts are usually midline neck swellings though some of them may deviate to either side of midline.¹⁸ But in our study all of our cases of thyroglossal cysts presented with midline neck swellings.

All of our patients with thyroglossal cysts underwent Sistrunk operation to avoid any recurrence.^{6,19} It is important to rule out ectopic thyroid tissue in the neck which may be mistaken for the thyroglossal cyst and can be the only thyroid tissue present in the body.²⁰ For this thyroid scans of the patients were done to avoid inadvertent removal of the only thyroid tissue present in the body. No ectopic thyroid tissue was found during our study. Amongst midline neck swellings, solitary nodules of thyroid isthmus have the incidence of 22.85% in our study. Most of the solitary thyroid nodules were benign swellings as shown on FNAC.²¹ Plunging ranula and dermoid cysts are amongst the most uncommon midline neck swellings as seen in our study as well as other studies conducted in other parts of the world.^{22,23} In case of plunging ranula the cervical swelling was associated with prolongations of sublingual gland into or through the mylohyoid muscle.

CONCLUSION

Lymph node enlargement are among the most common causes of midline neck swellings. Thyroglossal cysts are also found among the midline neck swellings but not as frequently as solitary thyroid nodules of the isthmus. Dermoid cysts and plunging ranulas are quite rare causes of midline neck swellings.

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Address for correspondence Author:

Dr. Quddus-ur-Rehman
Associate Professor of Anatomy
Independent Medical College, Faisalabad.
Email:drquddus_2003@hotmail.com
Ph #: 03336517421