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Unusual Neck Masses: Case Report

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Abstract **Two unusual neck masses representing two different types of pathological conditions have been presented. These are large branchial cleft cyst and lateral aberrant thyroid rest. The embryological and physiological basis of treatment were discussed. Although these lesions may not be exceedingly rare but they are quite interesting in terms of the size, the nature of the disease and its relative rarity.**

The recent experience with two unusual neck masses prompted the authors to present the cases, review the pathological nature of the diseases and their treatment. These two cases represented different varieties of pathological conditions being a congenital mass in one case and metastatic carvical lymph nodes in the other.

Congenital Mass (Branchial Cleft Cyst)[1]

Case 1:

This 53 year-old male was admitted to Phuket Adventist Hospital on November 27, 1996 with the chief complaint of a large meass occurring on the right side of the neck which was noted for at least 20 years and had recently increased in size. There was no pain nor fluid discharge from the mass. On examination, the mass was firm, cystic and quite large (about 6 cm in diameter). It was felt beneath the upper half of the sternocleidomastoid muscle. Laboratory findings were as follows:

WBC was 8400 with 72 per cent neutrophils, hematocrit 40 per cent.

FBS was 92mg/dl, BUN 15 mg/dl. urinalysis was normal.

EKG was normal but the chest X-ray showed pulmonary infiltration in the anterior segment of the right upper lobe.

The patient was prepared for surgery but this had to be postponed because of the X-ray finding. He was treated for pneumonitic infiltration for 10 days until this had cleared up. The initial diagnosis was branchial cleft cyst. No fluid was obtained from attempt at aspiration of the cyst.

Surgery was performed under general anesthesia through an oblique incision along the anterior border of sternocleidomastoid muscle and soon the cystic mass was encountered. Careful dissection was made around the mass which finally could be removed in toto. The upper part of the mass seemed to extend toward but did not reach the pharynx. His postoperative recovery was uneventful.

Pathological Reports: Formalin-fixed specimen consisted of an oval-shaped cyst, measuring 7×4×4 cm. The outer surface was light brown and smooth. The cut surface was gray-white and smooth inside. The cyst contain yellowish white sebum-like material. The wall was thin, less than 0.2 cm in thickness. Sections of the specimen showed a thin-walled cyst made up of fibrous tissue and lymphoid follicles. The inner side was lined by squamous epithelium. Pathological diagnosis was branchial cleft cyst.

Comment: This pathological condition is not, as a matter of fact, quite rare. Nonetheless, it is very unusual to find this congenital cyst of this size to be left untreated for nearly 20 years. Embryologically,[2] this branchial system is found early at 5 mm embryo stage (week 4) with its 4 arches, 4 pharyngeal clefts and 5 pharyngeal pouches. Early in the intrauterine life, the branchial arches appear as parallel bars occupying a region which later becomes the neck. They represent the gill mechanism in the fish of which the respiratory function of oxygen and carbon dioxide exchange takes place. In higher vertebrates, this function is replaced by aerial respiration and hence this function is lost. The number of arches is reduced to 6 in man. The 5th and 6th arches are blended with the surrounding structures and become non distinct. Each arch has an outer covering made up of ectoderm (squamous epithelium) and inner covering of entoderm (columnar epithelium) and an intermediate mass of mesoderm. Between these bars or arches, internal and external depressions are found and named branchial pouches and branchial clefts respectively. Each arch is supplied by a nerve and artery. The first arch (or mandibular arch) is supplied by the mandibular branch of the 5th nerve, and the external maxillary artery. Its muscle develops into the muscle of mastication. This arch becomes differentiated into a mandible, malleus and incus. The second (hyoid arch) is supplied by the facial nerve, and its artery is the external carotid artery. Its muscle becomes the muscle of facial expression and platysma. The stapes, styloid process, stylohyoid ligament and the lesser cornu of the hyoid bone develop from the second arch. The third arch (thyrohyoid arch) is supplied by the glossopharyngeal nerve and internal carotid artery. The stylopharyngeal muscle, the body and the greater cornu of the hyoid bone develop from this arch. The 4,5,6th are unnamed and somewhat indefinite.

The pharyngeal pouches are balloon-like diverticulae of the pharyngeal entoderm that line the inside of the branchial arches. There are 4 well developed pairs of pouches (pouch 1 lies between arches 1 and 2). The fifth pair is absent. The arches enclose the primitive pharynx within which develop the important structures; tongue, tonsils, eustachian tubes, thyroid, thymus and parathyroids. The first pharyngeal or branchial pouch elongates as the tubotympanic recess and appears between the external and internal ear enveloping the middle ear bone. The distal portion reaches the first branchial groove or cleft to form the tympanic cavity and mastoid antrum. The remainder forms the eustachian tube opening into the pharynx. Fusion of the ectoderm and the entoderm forms the tympanic membrane.

At 8 mm, arch 2 develops more rapidly than the others and overlaps the other arches caudally. At about 13 mm, arch 2 has entirely overlapped arches 3, 4 and has closed the 2nd, 3rd, 4th pharyngeal or branchial clefts to form a groove lined by squamous epithelium, the so called cervical sinus which disappears later. The first pharyngeal or branchial cleft is the only one to persist but only partly, to form the epithelium of the external auditory meatus and part of the tympanic membrane.

When the downgrowing second arch eventually meets and fuses with the fifth arch and if this space persists, a branchial cyst results. The cyst is located along the anterior border of the sternocleidomastoid muscle in the upper third of the neck. If the second arch fails to meet the fifth, an opening called a branchial fistula is formed along the lower anterior border of the sternocleidomastoid muscle above the sternoclavicular joint. Since the branchial fistula is situated below the second arch and above the third arch, its course would be passing between the internal and external carotid arties. The facial and the hypoglossal nerves lie superficial to the fistulous tract and the glossopharyngeal nerve lies deeper to it. If the fistula extends upward to the pharynx it will pass between the stylohyoid and the stylopharyngeus muscle. The internal fistulas are rare. Second branchial cleft sinus or fistula is usually suspected when recurrent fluid drainage is noted from the external opening of the tract at the anterior border of the lower third of the sternocleido mastoid muscle. The treatment[1] is surgical excision

of the cyst and entire tract through a series of two or more small transverse incisions in a step-ladder fasion instead of using a long oblique incision in the neck.

Metastatic Cervical Lymph Node (Lateral Aberrant Thyroid Rest)[3,4]

Case 2:

This 27 year-old female was seen at an outpatient clinic of Phuket Adventist Hospital with a firm mass on the left side in the posterior triangle of the neck which had been noted for approximately 2 years. There was no pain associated with this mass. The mass was felt like an enlarged cervical node about the size of the thumb and seemed to be in the spinal accessory chain of nodes. No other nodes were enlarged. The thyroid gland was not distinctly palpable[5] for certainty even though she was not obese or had a thick neck. Her chest X-ray was normal. She underwent surgical excision under local anesthesia on November 11, 1997. The node appeared to be dark in colour and quite firm.

Pathological Report: Formalin fixed specimen consisted of a cystic mass, measuring 2.5×1.6×1.4 cm. The cut surface was partly solid and partly cystic. The solid part was gray white measuring 1×1×0.3 cm. The cystic part contained colloid material. Section of the specimen showed colloid materials and papillary fronds of atypical columnar cells. Psammoma bodies were seen. Pathological diagnosis was metastatic papillary carcinoma of the thyroid.

Further investigation revealed T4 was 95 nmol/l and T3-1.5 nmol/l which were normal. WBC was 7,800 with 61 per cent polymorphonuclear cells. The hematocrit was 38 per cent. Liver function tests were all normal. The patient was advised to have thyroidectomy but unfortunately, she moved back to Bangkok and was lost to follow up. Indirect cotnact with one of her relatives gave an information that she had subsequently undergone thyroid surgery for malignancy at other hospital. In retrospect, preoperative thyroid scan would have yielded some information as to the uptake of the gland is concerned. However, thyroid scan lately has lost its popularity and has been replaced by other diagnostic procedures.

Comment: Papillary thyroid cancer[4] is the most frequent type of cancer, frequently occurs in the young with the peak incidence in the third to fourth decades. Female to male ratio is 3:1. The cancers are often multicentric with 33-40 per cent of cases exhibiting microscopic or gross tumor within the contralateral lobe. Metastasis is usually to the lymph nodes in the central compartment of the neck or into the superior mediastinum. The spread is then toward the jugular nodes and later to the lung and bones. The so called Lateral Aberrant Thyroid Rest, the metastatic thyroid tumor is almost always papillary cancer that had replaced a lymph nodes in the neck. Occult papillary cancer refers to primary lesions less than 1.5 cm in diameter which often can not be palpated. The prognosis of this type of cancer is the best of all thyroid cancers with 8-12 per cent mortality rate at 10 years. As a rule, it is quite common to find a detectable goiter with metastasis to the neck node but prior detection of the secondary cancer in this cervical node with no grossly palpable primary site is very unusual or quite rare. The surgeon may encounter this incidence in the large thyroid center but personal experience by a single surgeon in an ordinary hospital in his lifetime is really rare.

The well accepted[4] surgical treatment of a small papillary tumor less than 1 cm in diameter with no capsule invasion, no lymph node metastasis or in young person, the so called occult lesion is lobectomy. This is considered to be adequate if thyroidectomy has been done for other benign thyroid condition. In such cases, re-operation is unnecessary. Postoperatively, thyroid hormone should be given to suppress TSH and followed up at regular intervals. Nonetheless, most papillary cancers as one knows are neither minimal or occult. They are microscopically multicentric in up to 80 per cent of cases, or they may have node metastasis or local invasion. In such cases, near total or total thyroidectomy with neck dissection is recommended if lymph nodes are involved. Modified radical neck dissection should be performed when the tumor is found in the lymph node in posterolateral region. Total or near total thyroidectomy is performed because of high incidence of multi-centricity and bilaterality of the lesions. Furthermore, radioiodine therapy is recommended if there is lymph node metastasis, local recurrence, local invasion or distant metastasis since radioiodine is taken up by metastatic papillary cancer only after normal thyroid tissue has all been removed.

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