
DIAGNOSTIC IMAGING OF THE LATERAL NECK MASSES IN ADULTS: A STUDY IN RAMATHIBODI HOSPITAL.

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ABSTRACT

The retrospective study of roentgenographic evaluation for solely lateral neck mass in 146 adult patients at ENT clinic, Ramathibodi Hospital, during 1987-94 prior to panendoscopy with random-guided- directed biopsy of upper aerodigestive tract was proposed. X-ray chest (PA view) showed abnormal in 21.3%. Tuberculosis, non-tuberculosis, pulmonary mass, hilar or mediastinal mass and miliary infiltration were 5.5,6.2,2.7, 6.2 and 0.7% respectively. Panendoscopic finding was abnormal only in 1 case. Barium swallowing in 67 cases had sensitivity, specificity, accuracy, positive predictive value and negative predictive value of 50.0,96.6,91.1,66.7 and 93.4%. It was necessary to be done in swallowing disorder patients. CT scan of the head and neck region in 18 patients, 16 had abnormal findings; it was recommended in suspected nasopharyngeal cases or lessions difficult to be palpated. Other investigations such as thyroid scan, neck ultrasonography, sialography or angiography was used when they were indicated. Roentgenographic cost had an importnat role in order to choose the suitable investigation and gave maximal benefit for patients.

Keywords: lateral neck mass, roentgenography, adult

INTRODUCTION

Lateral neck masses are usually caused by lymphadenopathy. The primary source may be within or outside the head and neck region and the only chance for cure or palliation is to find and treat the primary site. There is a significant incidence of multiple separate primary malignancies of the head and neck, so that, a divergent opinion as to the optimum diagnostic management of these patients exists. The improvements in physical examination techniques and the introduction of new endoscopic techniques have led to the ability to diagnose the vast majority of upper aerodigestive tract carcinomas (1,2,3). The fine needle biopsy and improved cytologic techniques, have contributed to the improved management of these patients

(4,5). The imaging modalities, both conventional and high technology types, also have the similar importance (6-11).

To define the role of the diagnostic imaging in the evaluation of the patients presented with lateral neck masses, we conducted a retrospective study in 146 patients.

PATIENTS AND METHODS

A retrospective study of 146 patients (between 1987-1994) who presented at the department of Otolaryngology, Ramathibodi Hospital with the lateral neck masses. There were 98 males and 48 females. The age ranged between 21-74 years old. The mass was present for 2 days to 8 years.

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The time used for the diagnosis was 2 weeks to 7 months. The total admission time was 2 to 4 days. The follow up time was 4 weeks to 5 years. The clinical information and the results of the diagnostic tests were reviewed from the patients' files. The detailed information was shown in table 1-8. The location of the lymph node or mass in the lateral part of the neck was illustrated in figure 1.

DISCUSSION

Evaluation of the patients with lateral neck masses by imaging modalities, we should begin with plain film of the chest which enable us to visualize the mass larger than 1 cm of the bronchus. If the mass is larger than 2 cm in the main bronchus near hilar area or in the mediastinum, it will be detected (6), but the false negative result varied from 0-56% (12-16). The mediastinal widening or hilar mass could be seen from malignant lymphoma.

Barium swallow could detect cancer in the upper aerodigestive tract, up to 90% for the superficial type. For the flat type or the spreading type, larger than 1 cm, only the panendoscope could detect it and the false negative could vary from 0-75% (7,15,17,18).

Sialography should be done only in some selective cases, e.g. increasing in size of the mass related to the food ingestion or salivation.

Ultrasonography helped to differentiate between cystic and solid lesion, enlarged nodes, abscess, salivary gland lesion and mass near the large vessels. The lesion hidden by the bony part of the face could be missed. Evaluation of the thyroid gland by this modality is 90% accuracy (19,20). In addition, the fine needle aspiration biopsy, guided by ultrasonography was very helpful.

Carotid angiography was used in the diagnosis of the pulsatile or expansile mass, the mass with bruit, e.g. hemangioma, arteriovenous malformation and paraganglioma. Intra-arterial embolization, before surgery helped to reduce the amount of blood loss.

CT scan was used in the submucosal lesion of the upper aerodigestive tract (8,21) or lesion deep in the neck which was not render for palpation (22,23). Evaluation of the extension of the disease was quite

accurate, CT scan and valsalva maneuver could be used in the case of laryngeal cancer spreading to the preepiglottic space, subglottic area, Morgagni's ventricle or pyriform sinus (24,25). Multiple sites of the thyroid cancer with lateral neck metastases and substernal involvement were well shown by CT study (26).

MRI study gives more information about the vascular invasion, involvement of the muscles, aerodigestive tract (27), the tumor of the tonsil, the anterior floor of the mouth and the base of the tongue (28,29). In addition, there is no hazard of radiation from MRI machine.

Thyroid scan scintigraphy is not very useful due to the lateral location of the neck masses. The technetium pertechnetate radionuclide scan is used in the diagnosis of the salivary gland tumor such as Warthin's tumor or oncocytoma(11).

Several conclusion could be drawn from this study

1. Plain roentgenography of the chest should be performed in every patient before endoscopy was made. The study was cheap and eligible. One patient with abnormal chest film (mass) and abnormal endoscope (bronchial bleeding) was shown to be carcinoma by neck mass biopsy. Every normal chest film also had normal bronchoscopy.

2. Barium swallow was not helpful for the patients who had no symptom of dysphagia.

3. CT scan was useful in the cases of nasopharyngeal mass, mass at head and neck which was difficult for palpation and helpful in the staging of the disease.

4. MRI scan gave more detail of the mass except the associated bone lesion.

5. Our ultrasonographic cases were too few in number to made a conclusion.

6. Sialography should be used in the enlarging mass relating to tasty food ingestion, or salivation.

7. Angiography would be used in the cases of pulsatile or expansile mass.

8. Serum for EBV titer and fine needle aspiration biopsy of the lateral neck mass before imaging study may helped in detecting many lesions e.g. malignant lymphoma, tuberculous adenitis, branchial cleft cyst etc.

Table 1. Incidence of the pathology of the 146 patients

Pathology	No. of cases	(%)
Cancer of the upper aerodigestive tract	76	(52)
Malignancy of the lymph nodes	17	(12)
Tuberculous adenitis	24	(16)
Others*	29	(20)

* reactive hyperplasia of the nodes, neurilemoma, branchial cleft cyst, lymphadenitis, carotid body tumor, pleomorphic adenoma, pleomorphic lipoma, cavernous hemangioma and chronic sialadenitis

Table 2: Incidence of the diagnostic imaging examination

Types of investigation	No.of pts (%)	No.of abn.cases (%)
Conventional imaging		
Plain film of the chest (PA view)	146 (100)	28 (19)
Barium swallow	67 (46)	10 (15)
Sialography - Parotid gland	3 (2)	3 (100)
- Submaxillary gland	2 (1.5)	2 (100)
High-technology imaging		
CT scan of the head & neck	18 (12)	16 (89)
CT scan of the chest	1 (1)	1 (100)
MRI of the head & neck	1 (1)	1 (100)
Thyroid scintigraphy	16 (11)	2 † (12.5)
Ultrasonography of the neck	3 (2)	3 (100)
X-ray mammography	2 (1.5)	0 (0)
Carotid angiography	2 (1.5)	0 (0)

Table 3. The incidence of the results of the chest roentgenography in 146 studied patients

Pathology*	No. of cases	(%)
Normal	118	(81)**
Pulmonary fibropatchy infiltration or calcified granuloma (Tbc)	8	(5.5)
Pulmonary infiltration (non-Tbc)	9	(6)
Pulmonary nodule or mass	4	(3)
Miliary pattern	1	(1)
Widening of the mediastinum, hilar mass	9	(6)

* in 3 patients there are 2 different abnormal findings.

**also had normal upper airway endoscopy

Table 4. The abnormalities that were seen at barium swallow study of 10 patients and at panendoscopy, random-guided-directed biopsy (RGDB) in 13 patients

Panendoscopy	RGDB	Barium swallow
1. Rt. tonsillar polyp	SCCA*	Lt pyriform mass
2. Swelling of post cricoid and arytenoid area	Negative	Lt pyriform mass
3. Arytenoid cyst	Chr.inflammation	Lt pyriform mass
4. Esophageal mass,	Sq.metaplasia tracheal compression	Upper esophageal irregularity
5. Esophageal irregularity	Acute ulceration	Upper esophageal narrowing
6. Negative	Negative	Vallecular irregularity
7. Negative	Negative	Prominent upper esophageal mucosa
8. Negative	Negative	Hypopharyngeal incoordination
9. Negative	Negative	Minimal aspiration
10. Negative	Negative	Minimal aspiration
11. Bulging nasopharynx	Anaplastic carcinoma	Negative
12. Negative	Nasopharyngeal SCCA	Negative
13. Negative	Nasopharyngeal SCCA	Negative
14. Bronchial mass	Caseous granuloma	Negative
15. Hypopharyngeal mass	SCCA	Negative
16. Pyriform mass	Negative	Negative
17. Tongue base induration	Negative	Negative

*SCCA-Squamous cell carcinoma

Table 5. Relationship between barium swallow, panendoscopy and random-guided - directed biopsy (RGDB) in 67 patients

		Panendoscopy and RGDB	
		Positive	Negative
Barium swallow	Positive	4	2
	Negative	4	57

The sensitivity of barium swallow was 50%, the specificity was 97%, the accuracy was 91%, the positive predictive value was 67% and the negative predictive value was 93%.

Table 6. Comparison of the abnormalities detected by CT scan of the head and neck in 18 patients with panendoscopy and random-guided-directed biopsy (RGDB).

CT scan	Panendoscopy	RGDB	Diagnosis
1. NP	Irregular base of tongue	mild dysplasia	Ca, Primary ?
2. NP	Contact bleeding of vallecule and NP bulging	CA vallecule, Normal NP	Ca Vallecule
3. NP	Normal	Ca	Ca-NP
4. NP	Normal	Normal	Reactive hyperplasia
5. NP	Normal	Normal	Ca, Primary ?
6. NP	Normal	Normal	Ca, Primary ?
7. NP, LN	Normal	Normal	Ca, Primary ?
8. NP, LN	Normal	Ca	Ca, NP
9. Multiple LN	Normal	Normal	Ca, Primary ?
10. spinal accessory LN	Normal	Normal	Ca, Primary ?
11. Cervical cyst and mass	Normal	Normal	Brancheal cleft cyst
12. Parotid space mass	Normal	Normal	Ca-parotid gl.
13. Parapharyngeal mass	Normal	Normal	Ca parapharynx
14. Hypopharyngeal mass	Normal	Normal	Tuberculosis
15. Pyriform mass	Pyriform mass	Ca	Ca-pyriform
16. Carotid body tumor	Normal	Normal	Schwannoma
17. Normal	Normal	Normal	Ca, Primary ?
18. Normal	Normal	Normal	Ca, Primary ?

NP = nasopharyngeal irregularity, prominent or mass

LN = cervical lymph nodes

Ca = carcinoma

Diagnosis = final diagnosis by fine needle aspiration biopsy or cervical mass excision.

Table 7. Expense for each imaging modality

Type of Examination	Price in Baht	
	Service	Private
1. Plain x-ray Chest	100	120
2. Barium Swallow	400	500
3. Sialography (Parotid or Submaxillary)	600	1,200
4. CT scan of the head neck	4,000	4,500
5. MRI of the head and neck	8,000	10,000
6. Thyroid scintigraphy	500	500
7. Ultrasonography of the neck	300	400
8. X-ray mammography	400	600
9. Carotid angiography	3,500-6,500	3,500-6,500

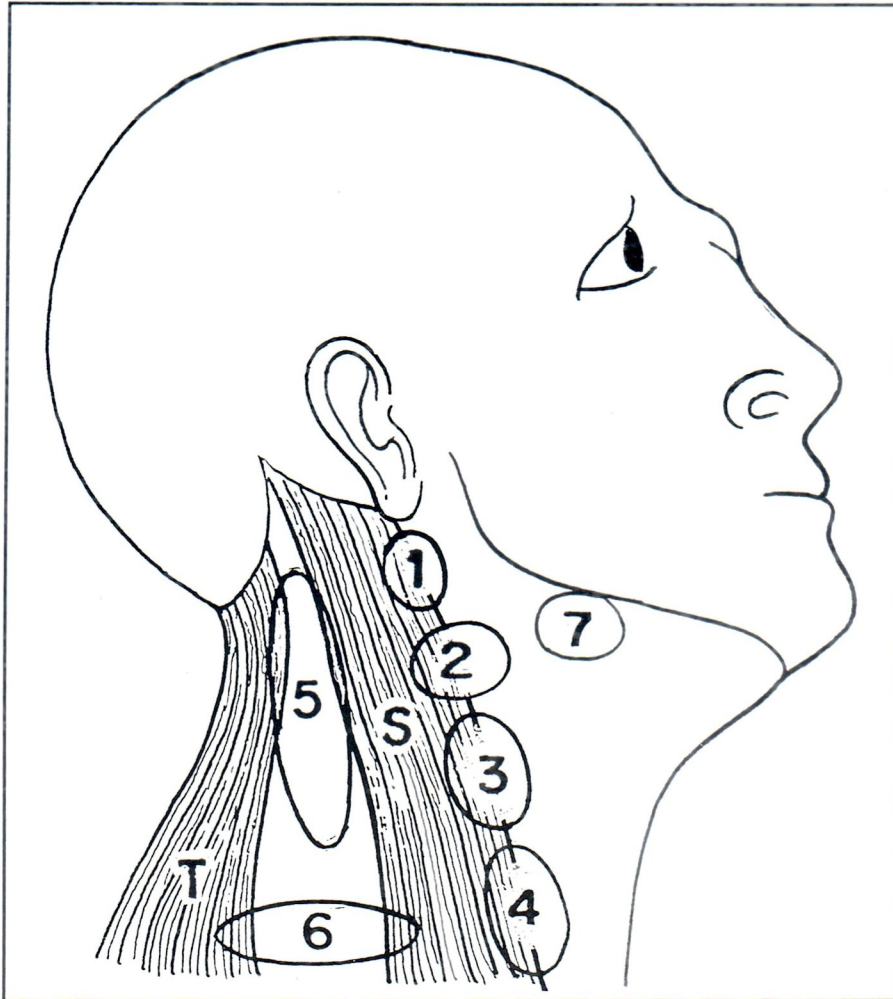


FIG.1. LOCATION OF LYMPH NODE OR MASS IN LATERAL NECK.

1. SUPERIOR 2.&3. MIDDLE 4. INFERIOR (1,2,3,4 = INTERNAL JUGULAR CHAIN)

5. POSTERIOR TRIANGLE

6. SUPRACLAVICULAR 7. SUBMANDIBULAR

S = Sternocleidomastoid muscle

T = Trapezius muscle

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