

# A POSTMORTEM STUDY OF THE PYRAMIDAL LOBE OF THE THYROID GLAND IN BANGLADESHI PEOPLE

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## **Abstract:**

**Background:** The pyramidal lobe is also called the 3<sup>rd</sup> lobe of the thyroid gland which ascends toward the hyoid bone from the isthmus or the adjacent part of either lobe. A fibrous or fibromuscular band the levator glandulae thyroideae occasionally extends upwards from the apex of the pyramidal lobe to the body of the hyoid bone. Any pathology of thyroid gland involves this lobe, some pathology started from here or recurrence may occur from this lobe. Anatomical knowledge about pyramidal lobe is essential for surgeons, endocrinologists, pathologists and sonologists for proper diagnosis and management of thyroid diseases.

**Study design:** Cross sectional descriptive type of study.

**Place and period of study:** Department of Anatomy, Sir Salimullah Medical College, Dhaka. Study period was from July 2003 to June 2004.

**Materials:** The study was done by examining 60 post mortem human thyroid glands, age ranging from 7 to 67 years. The glands were collected from unclaimed dead bodies autopsied in the morgue of Dhaka Medical College and Sir Salimullah Medical College under the department of Forensic Medicine.

**Methods:** The collected sample were grouped in to three age groups including group A(0-20 years), group B (21-50 years) and group C (>50 years). The presence, variation of position of the pyramidal lobe and its relation with levator glandulae thyroideae were studied.

**Result:** The pyramidal lobe was found in 16 of 60 thyroid glands in different age groups and situated more on the left side than the right. In 9 cases, levator glandulae thyroideae were found. All extended from the apex of the pyramidal lobe to the body of the hyoid bone.

**Key words:** Pyramidal lobe, levator glandulae thyroideae, thyroid gland.

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## **Introduction:**

The thyroid gland is the largest and one of the most important endocrine gland of human body<sup>1</sup>. It is brownish red and highly vascular, situated anteriorly in the lower neck at the level of C<sub>5</sub> to T<sub>1</sub> vertebrae<sup>2</sup>. Thyroid tissue is present in all vertebrates<sup>3</sup> and secreted hormones are essential for normal growth, development and metabolism<sup>4</sup>. This gland consists of right and left lobes connected by a narrow median isthmus. A conical pyramidal lobe ascends the hyoid bone from the isthmus or adjacent part of either lobe<sup>2</sup>. The thyroid gland develops as an epithelial proliferation in

the floor of the pharynx at a point later foramen cecum<sup>5</sup>. Pyramidal lobe is a glandular tissue developed from the lower end of the thyroglossal duct<sup>6</sup>. A fibrous or muscular band frequently connects the pyramidal lobe to the hyoid bone<sup>7</sup>. This gland is not essential for life<sup>3</sup>, but the absence of this gland will cause various disorders in human body. Disorders of thyroid gland are common<sup>4</sup>. About 5 percent of the populations are affected by thyroid diseases<sup>8</sup>. Any diseases of thyroid gland may involve the pyramidal lobe i.e. Grave's disease or thyroid cancer<sup>9</sup>. Therefore, anatomical knowledge of pyramidal lobe has a great importance to the

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surgeons, endocrinologists, pathologists and sonologists. The knowledge about levator glandulae thyroideae is also essential for thyroid surgeons to avoid any iatrogenic injury.

**Materials & Methods:**

A cross sectional descriptive type of study was performed on 60 thyroid glands. All the samples were collected from unclaimed dead bodies autopsied in the morgue of the Department of Forensic medicine of Dhaka Medical College and Sir Salimullah Medical College, after requisite legal formalities from July 2003 to June 2004.

*Grouping of the sample:*

The collected samples were divided into three age groups. Group A (0-20 years), Group B (21-50 years) and Group C (>50 years) (Table: I), according to Brown, Al-Moussa and Beck (1986)<sup>10</sup>.

*Procedure of study:*

The collected samples were washed thoroughly with running tap water and were kept into 10% formol saline solution for preservation and fixation. The anterior aspect of the sample consisting of tongue, pharynx, esophagus, larynx, trachea, thyroid, parathyroid glands and major vessels of the neck was taken on a tray. These were dissected and the topographical relations of thyroid glands were observed. During dissection, observation notes were kept about the presence of pyramidal lobe. If present, its position was noted. Levator glandulae thyroideae muscle was traced. If present, its craniocaudal extension was noted and relation with the pyramidal lobe was also observed.

*Statistical Processing of data:*

Statistical analysis were done unpaired student’s ‘t’ test. All the statistical analyses were done by SPSS 11.0 version.

**Results:**

The present study was carried out on 60 human thyroid glands of different age. All the samples were collected from cadavers and examined morphologically in each age group.

**Pyramidal Lobe**

The incidence and attachment of the pyramidal lobe to the main part of the thyroid gland are shown in Table: II & Fig. 1. It was observed that 16 thyroid glands out of 60 possessed pyramidal lobe. In every case, the pyramidal lobe was single except in two cases pyramidal lobe was double. It was also observed that pyramidal lobe was situated more on the left side than on the right. Its base was attached to the left-half of the upper border of the isthmus with or without encroachment on the adjacent part of the left lobe.

**Levator Gladulae thyroideae:**

In present study, total 60 cadavers were examined for levator glandulae thyroideae which are shown in Table: III & Fig. 2. In 9 cases, levator glandulae thyroideae was found. In all cases, levator glandulae thyroideae extended from the apex of the pyramidal lobe to the body of the hyoid bone.

**Table-I**

*Grouping of the sample of the present study. (n=60)*

Group	Age in years	Number of sample
A	0-20	14
B	21-50	38
C	> 50	8

**Table-II**

*Incidence of attachment of the pyramidal lobe with its origin in relation to isthmus in different age group*

Group (n)	Site of attachment			Absent
	Left side of the isthmus	Middle of the isthmus	Right side of the isthmus	
A (14)	0	1 (7.1%)	1 (7.1%)	12 (85.7%)
B (38)	5 (13.2%)	3 (7.9%)	2 (5.3%)	28 (73.7%)
C (8)	4 (50%)	0	0	4 (50%)

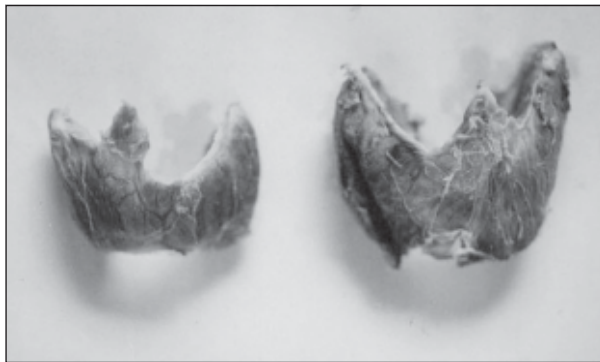
P value 0.096<sup>ns</sup>

**Table-III**

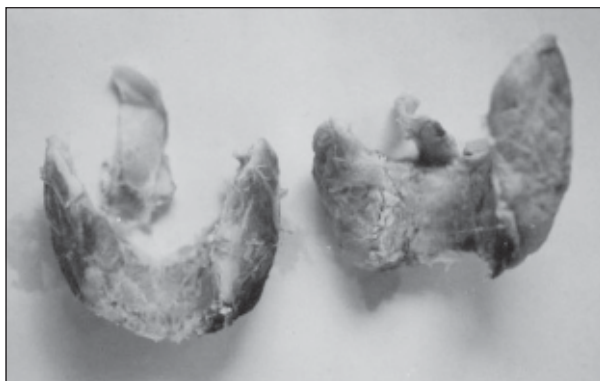
*Incidence of levator glandulae thyroideae in different age group*

Group (n)	Absent	Present
A (14)	13 (82.9%)	1 (7.1%)
B (38)	33 (86.8%)	5 (13.2%)
C (8)	5 (62.5%)	3 (37.5%)

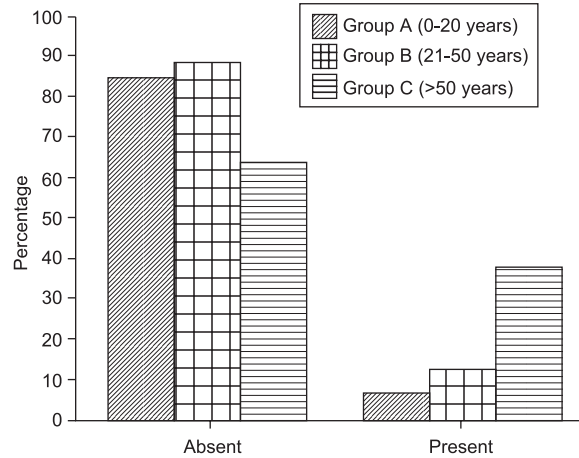
P value <0.05\*



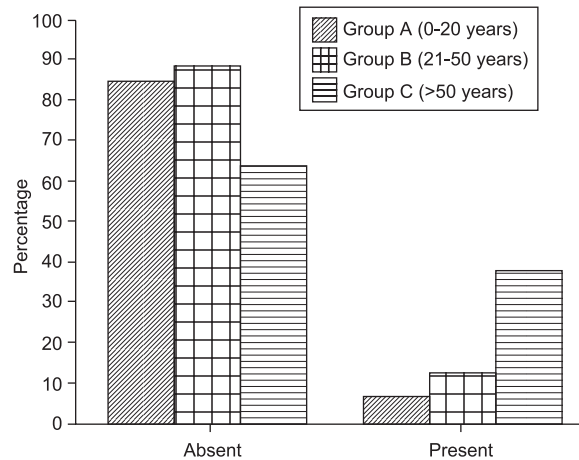
**Fig.-1:** Photograph showing the anterior view of the pyramidal lobe arising from the right half of the isthmus and adjacent part of the right lobe of the thyroid gland (left) and from the left side of the isthmus and adjacent lobe (right).



**Fig.-2:** Photograph showing the posterior view of the pyramidal lobe with levator glandulae thyroideae arising from the left half of the isthmus and adjacent part of the left lobe of the thyroid gland (left) and from the middle of the isthmus (right).



**Fig.-3:** Incidence of attachment of the pyramidal lobe of the thyroid gland with its origin in relation to isthmus in different age group.



**Fig.-4:** Incidence of the levator glandulae thyroideae in different age group.

**Discussion:**

*Pyramidal lobe*

Izenstark (1968)<sup>11</sup> studied 130 patients among them he observed presence of pyramidal lobe in 39 i.e. 30% of cases. Blumberg (1980)<sup>12</sup> observed a total of 53 cases in which he found pyramidal lobe in 17 (32%) cases. Most of the pyramidal lobes were located at the left side. Banna (2008)<sup>13</sup> found 20 (37.04%) out of 54. Sultana et al. (2008)<sup>14</sup> observed 30 (50%) out of 60. Enayetullah (1996)<sup>15</sup> found 25 (50%) out of 50. Marshall (1895)<sup>16</sup> found in 43%, Hamilton (1976)<sup>17</sup> 40%, De Groot and Jameson (2001)<sup>18</sup> 15%, and Harjeet et al. (2004)<sup>19</sup> 28.9% of cases.

In most of the cases, the pyramidal lobes were found on the left side of the isthmus and associated with the levator glandulae thyroideae. The percentage of pyramidal lobe found in most of the past studies were higher than that of this study.

### **Levator glandulae thyroideae**

Enayetullah (1996)<sup>15</sup> found 16 levator glandulae thyroideae in 50 thyroid glands, whereas Lehr (1979)<sup>20</sup> found 13 out of 203, Banna (2008)<sup>13</sup> 32 out of 54, Sultana et al. (2008)<sup>14</sup> 26 out of 60 and Harjeet et al. (2004)<sup>19</sup> 19.5%. The percentage of levator glandulae thyroideae, found in most of the past studies, were higher than that of the present study.

### **Conclusion:**

Levator glandulae thyroideae and pyramidal lobe were present in 15% and 26% of cases respectively. All the levator glandulae thyroideae were found to extend from the apex of the pyramidal lobe to the hyoid bone and most of the pyramidal lobes originated from the left side of the thyroid gland.

### **Ethical clearance:**

This research work was approved by the Ethical Review Committee of Sir Salimullah Medical College, Dhaka.

### **Acknowledgement:**

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