A NOTE ON THE PARATHYROID GLANDS OF GANGES SUSU

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The parathyroid glands in man are small structures, each about the size of a match-head, and are loosely attached behind the rostral and caudal ends of the thyroid. Usually there are four, two on each side. The parathyroid glands are said to be concerned with the regulation of calcium and phosphorus metabolism. Although the role of the parathyroid glands in Cetacea should be as important as in land mammals, very few studies have been made on cetacean parathyroid gland.

Schulte (1916) pointed out a small glandular mass, which appears to have been the parathyroids in the macroscopic dissection of a 37.5 cm foetus of sei whale. Hosokawa (1955) detected a structure which was considered the anlage of the parathyroid on the lateral side of the fourth branchial pouch in a microscopical observation of a 12 mm striped dolphin foetus. In large-sized adult whales, Slijper (1962) described grey or pinkish parathyroid glands of fin whales, located on both posterior sides of the thyroid ; measuring 7 cm longitudinally and 4 cm transversally, and weighing 10–130 g with individual variations. Pilleri and Gihr (1969) reported two parathyroid glands on the dorsal side of the thyroid in gross anatomical observations of a Risso's dolphin.

The abovementioned previous reports were not studies of the parathyroids themselves, but were merely additional observations of the thyroid. No histological observation on the parathyroid glands of Cetacea has yet been reported. We wish to clarify the accurate structure of the cetacean parathyroid glands, and to compare it with those of other mammals with consideration of living environment. As a first step, the parathyroid glands of the fresh water Ganges susu and the salt water striped dolphin have been compared in this brief note.

Five Ganges susu, *Platanista gangetica* (body length from 105.5 cm to 118 cm) were used for this study. The specimens were examined macroscopically at the site of collection. Two fresh specimens (113 cm and 118 cm) among the five were prepared for histological observation. Six striped dolphins, *Stenella coeruleoalba*, from the late prenatal to adult stages, were examined for comparison and for a developmental study of the parathyroid glands.

The thoracic wall of a Ganges susu (body length, 118 cm) was incised to remove the heart. Figure 1 shows the heart and structures adjacent to the heart viewed from the ventro-rostral aspect. The thyroid gland appeared as a large dark brown mass measuring 31 mm (transverse diameter)×16 mm (longitudinal

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diameter)×8 mm (thickness) and weighing 3 g. After removal of the fibrous capsule covering the thyroid gland, numerous indentations were found on its surface. The carotid artery was adjacent to both the inferior and lateral edges of the thyroid. The thymus was light yellow and consisted of several large lobes, and was situated from the rostral part of the heart to rostro-lateral part of the thyroid. The thymus was abundant in interlobular connective tissue. Each lobe of the thymus was subdivided into lobules connecting to form a rosary around the blood vessel as an axis. Small tissue masses of various shapes were scattered around the thyroid, thymus and trachea. These massess were distinguishable microscopically into three kinds of structures ; the thymus, lymphatic tissue and para-

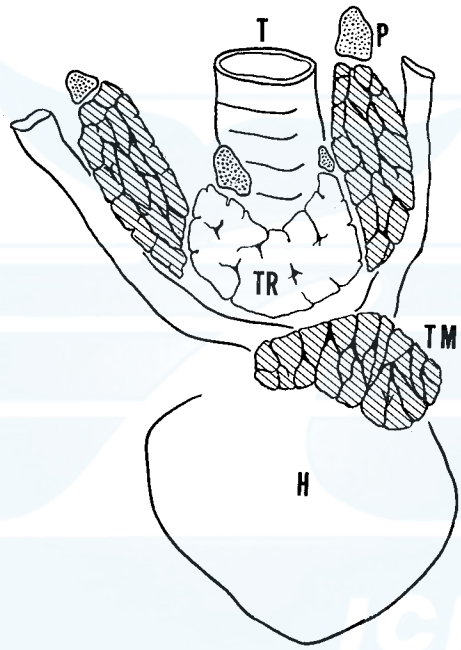

Fig. 1. The position of parathyroid glands of *Platanista gangetica*. The diagram indicates the position of the parathyroids of a 113 cm specimen added to those of a 118 cm one. (H) heart; (P) parathyroid; (T) trachea; (TM) thymus; (TR) thyroid.

thyroid. Two parathyroids were found in a Ganges susu, body length 113 cm, one each on the right and left sides of the thyroid at the rostral end. In a 118 cm susu, three parathyroids were observed ; one at the right rostral end of the thyroid, and one each at the rostral end of the right and left thymus. The largest of these parathyroids was flat and oval-shaped, measuring 14×6×2 mm and weighing 0.1 g. No parathyroids were found on the posterior side of the thyroids.

In the six striped dolphins observed most parathyroids were located around thr rostral ends of the right and left lobes of the thymus on both sides of the trachea.

The parathyroids were variable in number ; two glands in one case, three in three cases, and four in two cases. It is likely that the relationship between the parathyroid and thymus is more intimate in the striped dolphin than in the Ganges susu.

The fibrous tissue of the capsule of the parathyroids of the dolphins observed entered the parenchyma accompanyed by blood vessels, and divided it into numerous lobules. One of the characteristics of the parathyroid gland of dolphins is a great abundance of interlobular connective tissue finely dividing the glandular tissue. In some regions parathyroids contained heterotopic thymus tissue. The parenchymatous cells of the parathyroid were polygonal, about 10 μm in diameter, and had round nuclei. The parenchymatous cells of the parathyroid of the Ganges susu and striped dolphin consisted of only chromophobic chief cells. Acidophilic cells that are seen in man and some mammals could not be found.

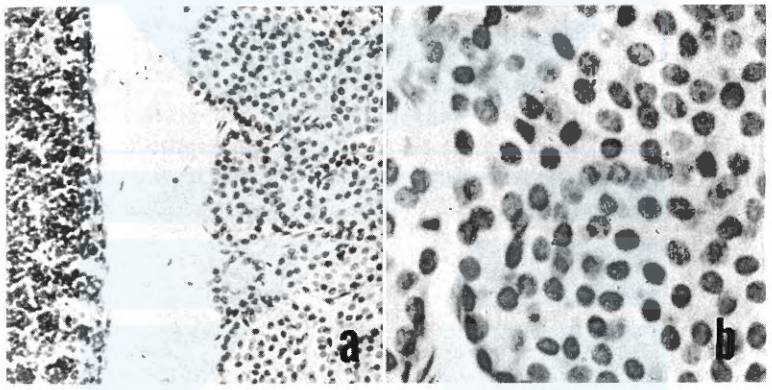

Fig. 2. a: Low magnification photomicrograph of section of thymus (left) and parathyroid gland (left) of a *Platanista gangetica* (body length, 113 cm). H-E stain. ×70. b: Photomicrograph of the parathyroid of *Platanista gangetica*. Only one chromophobic chief cell is shown in this field. H-E stain. ×400.

The epithelium of the dorsal wall of the third and fourth pharyngeal pouches differentiates into parathyroid tissue, while that of the ventral region of the third pouch forms the primordium of the thymus. With further development of the thymus and prarthyroid tissues, the thymus migrates in a caudal and medial direction, pulling the parathyroid tissue with it, moving to its final position in the thorax. In other mammals the parathyroid tissue of the third and fourth pouches finally comes to rest on the dorsal surface of the thyroid gland. However, the parathyroid glands of the dolphins observed did not lie on the dorsal surface of the thyroid but were found near the thymus. It has been said that the parathyroid glands are highly variable in number and location in mammals. This was confirmed in the dolphins we observed. Although the relationship between the parathyroid and the thymus in the observed dolphins seems to be closer than that in other mammls, further comparative observations of Cetacea are necessary to clarify whether this

is dependent on interspecific or individual differences.

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