

Morphological Studies on the different Lymph Nodes of Head Region in Buffaloes (*Bubalus bubalis*)

Poonam Saini¹, Hemant Joshi², Balwant Meshram³, Mahendra Kumar⁴, Sanjay Chouhan⁵, Pawan Kumar⁶
and Rahul Kumar Saini⁷

Department of veterinary Anatomy and Histology
College of Veterinary and Animal Science, Navania, Vallabh Nagar, Udaipur -313601

Received: 19 March 2025; Accepted: 20 May 2025

ABSTRACT

The lymphnode of head region included the parotid, mandibular, lateral retropharyngeal and medial retropharyngeal lymph nodes in buffalo. The parotid lymph node was the largest among the lymph nodes in the head region. It was located ventral to the temporomandibular joint, posterior to the upper portion of the masseter muscle and at the base of the ear. It was bean-shaped. The mandibular lymph node was located near the angle of the mandible, positioned dorsally to the linguofacial vein and medially to the sternocephalicus muscle. It rested on the lateral aspect of the rostral portion of the mandibular salivary gland and had a semi-circular shape. The lateral retropharyngeal lymph node was located under the wing of the atlas and was covered by the dorsal end of the mandibular gland. It was discoid in shape and brown to reddish-black in color. The medial retropharyngeal lymph node was situated between the caudal-dorsal wall of the pharynx and the longus capitis muscles, medial to the stylohyoideus muscles. It was roughly triangular in shape.

Key words: Parotid, Mandibular, Lateral and Medial Retropharyngeal, Head Region and Buffalo

Lymph nodes are important components of defense mechanism of the body. They are independent secondary lymphatic structures lying on the course of lymphatic vessels and play an essential role in regional immune response (Dellmann and Brown, 1981).

The parotid lymph node drains the upper half of the head and consists of a large, single parotid lymph node (Saar and Getty, 1975). The mandibular lymph node drains the rostral half of the head and consists of an oval-shaped, often double, mandibular lymph node (Grasse, 1972). The retropharyngeal lymph node drains the deeper, more caudal regions of the head and is composed of a medial and a lateral retropharyngeal lymph node (Grasse, 1972 and Grau, 1974). They play key role in initiating immune responses; lymph nodes respond to lymph-borne antigens.

The study was conducted on lymph nodes of head region obtained from a slaughterhouse located near Udaipur.

The parotid lymph node was the largest among the head in buffalo. It was located ventral to the temporomandibular joint, posterior to the upper

portion of the masseter muscle and at the base of the ear (**Fig.1**). The present findings were consistent with those of Ali *et al.* (1987) in donkeys, Bagi (1988) in buffaloes, Sarma *et al.* (2007) in pigs and Kalita *et al.* (2014) in Mizo local pigs. However, they differed from the observations of Sarma *et al.* (2004) in Bakarwal goats, where the parotid lymph node was completely covered by the parotid salivary gland.

It was bean-shaped with smooth lateral and medial surfaces, creamy white to pinkish in colour. These observations aligned with the findings of Sarma *et al.* (2008) in Kagani goats, Ducusin *et al.* (2009) in buffalo and Kalita *et al.* (2014) in Mizo Local pigs. However, the results differed from those of Bagi. (1988) in buffalo, Sarma *et al.* (2004) in Bakarwal goats and Sarma *et al.* (2007) in pigs, who reported an elongated shape.

The proximal extremity of the parotid salivary gland covered the caudal two-thirds of the lymph node, while the rostral one-third remained free. The caudal edge was thick, rounded and convex, while the rostral edge was thinner and slightly concave. The hilus was positioned approximately at the midpoint of the rostral edge of the lymph node (**Fig.2**).

The mandibular lymph node was found close to the angle of the mandible positioned dorsal to the linguofacial vein and medial to the sternocephalicus muscle. It rested on the lateral aspect of the rostral

1, 5, 6, 7. M.V.Sc. Scholar; 2. Assistant Professor; 3. Professor and Head; 4. Ph.D Scholar

*Corresponding Author: poonamsaini19876@gmail.com

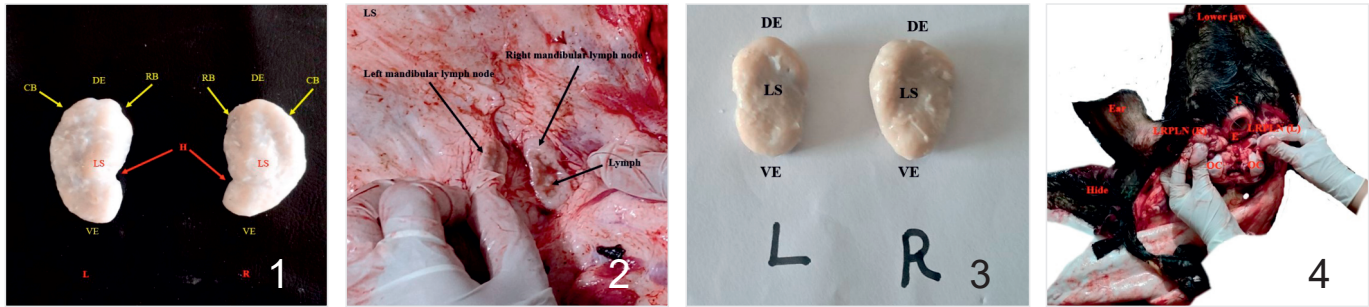


Fig 1: Lateral Surface of Right and Left Parotid Lymph Nodes of Buffaloes Showing Hilus (H), Caudal Border (CB), Rostral Border (RB), Dorsal End (DE) and Ventral End (VE); **Fig 2:** Longitudinal Section (LS) of Right and Left Mandibular Lymph Nodes of Buffaloes Showing Lymph. **Fig. 3:** Lateral Surface (LS) of Mandibular Lymph Node of Buffaloes Showing Dorsal End (DE) and Ventral End (VE); **Fig. 4:** Caudo-ventral View of the Head of Buffaloes Showing Larynx (L), Esophagus (E), Lateral Retropharyngeal Lymph Nodes (LRPLN) Right and Left, Lower Jaw, Ear, Occipital Condyle (OC) and Hide;

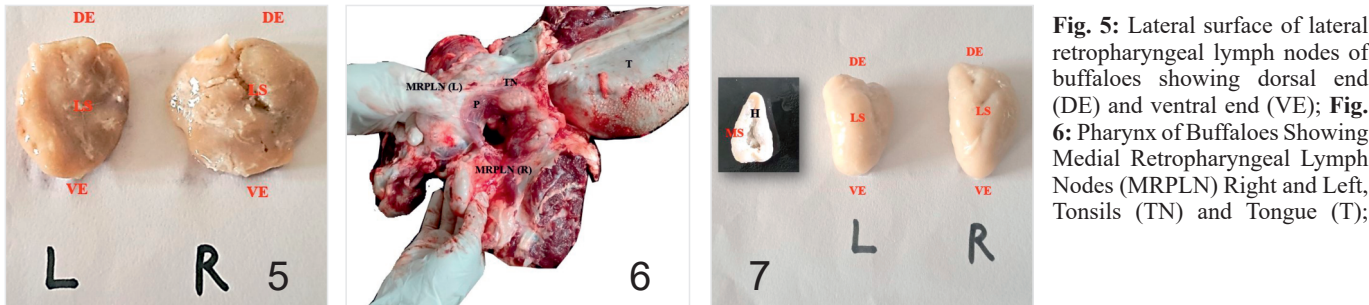


Fig. 5: Lateral surface of lateral retropharyngeal lymph nodes of buffaloes showing dorsal end (DE) and ventral end (VE); **Fig. 6:** Pharynx of Buffaloes Showing Medial Retropharyngeal Lymph Nodes (MRPLN) Right and Left, Tonsils (TN) and Tongue (T); **Fig. 7:** Lateral And Medial Surface of Medial Retropharyngeal Lymph Nodes of Buffaloes Showing Hilus (H), Dorsal End (DE) and Ventral End (VE).

portion of the mandibular salivary gland. It was semi-circular in shape, creamy white to pinkish in colour, in dense consistency and nodular surface with the lateral surface having thicker layer as compared to the medial surface (**Fig.3 and 4**). The hilus was located at the rostral end of the lymph node. The observations were in accordance with those of Bagi (1988) and Ducusin *et al.* (2009) in buffalo and Predoi *et al.* (2011) in sheep. However, the results were partially in harmony with those of Kalita *et al.* (2014) in Mizo local pigs and Dyce *et al.* (2010) in pigs. The accessory mandibular lymph node was situated on the sterno-hyoideus muscle, appearing as a single, oval and flat node on each side. The mandibular lymphocenters described in pigs comprised approximately six principal nodes and four accessory nodes. The present observations disagreed with those of Abdel-Magied *et al.* (2001), who described the mandibular lymph node in camels as having reddish-brown surface with patches and lobulated appearance. Ali *et al.* (1987) found that the mandibular lymph nodes in donkeys were located ventral to the tongue in the mandibular space at the level of the incisura vasorum facialis.

The lateral retropharyngeal lymph node was located under the wing of the atlas and covered by the dorsal

end of the mandibular gland (also called the atlantal gland). It was discoid in shape and brown to reddish-black in color (**Fig.5**). These lymph nodes lacked a clearly defined hilus. (**Fig.6**) The findings were consistent with those of Barrell and Simpson-Morgan (1990) in deer, Dyce *et al.* (2010) in ruminants, Predoi *et al.* (2011) in goats and Kalita *et al.* (2014) in Mizo local pigs. However, Ali *et al.* (1987) described them differently in donkeys, these nodes were situated against the lateral aspect of the guttural pouch, just caudal to the stylomastoid bone. They were positioned caudally to the hypoglossal nerve and the linguofacial artery and covered laterally by the jugulomandibular muscles, the caudal belly of the digastric muscle, the stylomastoid muscles and the mandibular salivary gland.

The medial retropharyngeal lymph node was situated between the caudal-dorsal wall of the pharynx and the longus capitis muscles, medial to the stylohyoideus muscles (**Fig.7**). Also called the parapharyngeal lymph nodes. It was covered by fat and white to pinkish in color, roughly triangular in shape and the hilus was located on the medial surface.

The results were similar to those of Ali *et al.* (1987) in donkeys, Barrell and Simpson-Morgan

(1990) in deer, Sisson (1914) in oxen. The dorsal surface of these lymph nodes was separated by a groove through which the carotid artery passed.

REFERENCES

- Abdel-Magied, E.M., Taha, A.A. M., Al-Qarawi, A.A. and Elfaki, M. G. 2001. The parotid, mandibular and lateral retropharyngeal lymph nodes of the camel (*Camelus dromedarius*). *Anatomia, Histologia, Embryologia*, 30 : 199-203.
- Ali, A. M. A., Saber, A. S. and Mansour, A. A. 1987. Lymphocenters of the head and neck of the donkey (*Equus asinus*). *Assiut Veterinary Medical Journal*, 18 : 22-29.
- Bagi A.S 1988. Gross and Histomorphological Study of Superficial Regional Lymph Nodes as Well as Lymphatics in Young and Adult Surti Buffalo. M.V.Sc. *Thesis Gujarat Agricultural University, Anand Campus, Anand Gujarat*.
- Barrell, G. K. and Simpson-Morgan, M. W. 1990. Major lymph nodes of the head of the fallow deer (*Dama dama*) and lymphatic drainage of antlers. *Australian Veterinary Journal*, 6 : 406-407.
- Dellmann, H. D. and E. M. Brown, 1981: *Textbook of Veterinary Histology*. Philadelphia, PA: Lea and Febiger, pp 170-176.
- Ducusin, R.J.T, Maala, C.P. and Binarao, B.V.L. 2009. Anatomy of the superficial lymph nodes of the Philippine water buffalo (*Bubalus bubalis*) important in clinical examination and meat inspection. *Philippine Journal of Veterinary Medicine*. 46 : 1-15.
- Dyce, K. M., Sack, W. O. and Wensing, C. J. G. 2010. *Textbook of Veterinary Anatomy (Eds. 4)* Saunders Elsevier ISBN: 978-1-4160-6607 pp.389-783.
- Gavrylin, P., Rahmoun, D.E., Lieshchova, M. and Benchadi, H. 2013. Features topography and macrostructure of lymph nodes in Camels (*Camelus dromedarius*). *Online Journal of Animal and Feed Research*, 3 : 106-110.
- Grasse, P.-P., 1972. *Traite' de Zoo'logie, Tome XVI, fascicule IV. Masson Editeurs, Paris*, pp. 873-881.
- Grau, H. 1974. Das Lymphatic system des Rindes. In: Ellenberger, W, Baum, H., *Handbuch der vergleichenden Anatomie der Haustiere*, 18. Auflage. Springer-Verlag, Berlin/Heidelberg/New York, pp 786-794.
- Kalita, A., Kalita, C. and Ooley, P. J. 2014. Gross Morphology of the Peripheral Lymph Nodes of Mizo Local Pig (*Zo Vawk*). *Indian Veterinary Journal*, 91 : 63-66.
- Predoi, G., Belu, C., Georgescu, B., Dumitrescu, I., Roşu, P. and Biţoiu, C. 2011. Morphotopographic study of the head lymphocenters in small ruminants. *Romanian Biotechnological Letters*, 16 : 6116.
- Saar, L.I. and Getty, R., 1975. Ruminant lymphatic system. In: Getty, R. (Ed.), Sisson and Grossman's. *The Anatomy of the Domestic Animals, 5th ed.*, vol. 1. W.B. Saunders Comp., Philadelphia / London / Toronto, pp.1024-1064.
- Sarma, K, Kalita, A, Suri, S. and Zama, M. M. S. 2004. Gross anatomical observations on superficial lymph nodes of Bakarwali goat (*Capra hircus*). *The Indian Journal of Animal Sciences*, 74 : 750-751.
- Sarma, K., Devi, J. and Srivastava, A. K. 2008. Morphological and morphometrical study of the superficial lymph nodes of kagani goat (*Capra hircus*) in Jammu region. *Folia Veterinaria*, 52 : 119-123.
- Sarma, M., Kalita, S. N., Goswami, R. N. and Sarma, K. K. 2007. Macro and micro morphology of the parotid lymph node of neonatal indigenous and crossbred piglets. *The Indian Journal of Animal Sciences*, 76 : 319-323.
- Sisson, S. 1914. *The anatomy of the domestic animals (Eds. 2nd)* WB Saunders company, pp-723.