

THE BIODIVERSITY OF MUSCULAR LYMPH NODES IN THE PELVIC LIMB AT HAMSTERS

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Abstract

The highlighting of the muscular lymph nodes in the pelvic limb was done by injecting the coloured substance intradermically. The coloured substance used was China Ink 40%, and the dose inoculated in the plantar pad was of approximately 0.1 ml.

The injected solution locally formed an intradermic button. Injection purposes was to obtain a contrast between lymph nodes and lymph vessels (which retain or contain the coloured substance) compared with adjacent regions. After the animals were sacrificed, they were dissected by conventional methods. It was harvested the subiliac lymph node from the flank region, in order to identify their histological structure.

By using the technique of inoculating coloured substance, highlighting ileofemoral lymph nodes, the popliteal lymph node, the superficial and profound inguinal lymph nodes and the subiliac lymph nodes was made possible.

For the histological examination a Nikon AFX-DX, Labophot 2, with an automatic exposure photographing device, controlled computerisedly was used. In the subcapsular sinus of the subiliac lymph node a numerous cell population can be noticed, represented by macrophagi and reticular cells.

Key words: hamster, lymph node, coloured substance.

INTRODUCTION

Knowing the lymphatic system in hamsters is necessary due to these animals being used as lab subjects, which imposes clinical examinations as well as medicine testing, and tracking local and general responses of the organism.

The lymphatic system includes a rich network of confluent lymphatic vessels, with their origins in capillaries throughout the body and whose last collecting branches deverse in the greater veins, located on the cranial side of the thorax.

The lymph nodes of the pelvic limb in hamsters respect the morphotopography of those existent in other domesticated mammals, though some particularities can be observed.

For instance, muscular relatively low volume is corelated to an approximate change in the lymph nodes' topography and morphology.

Due to the aforementioned issues the current work includes describing the lymphatic centers morphotopographically and microscopically at the pelvic limb in hamsters, completing the already existent data base in speciality literature.

MATERIALS AND METHODS

In the present work 8 adult hamsters of both sexes were used. These animals were kept under observation for 24 hours.

In order to highlight the lymph nodes and lymphatic vessels of the pelvic limb the coloured substance China Ink 40% was injected. This solution has to have been filtrated through filter paper fixed in an airtight glass funnel set on a Berzelius container.

0.5 ml of coloured substance were injected with atraumatic needles in the plantar pad until an intradermic button was formed.

The sacrificing of the injected animals was done one hour after they were inoculated, using the method of profound anaesthesia with etilic aether.

The histological study of the subiliac lymphatic center was done by colouring the samples with the hematoxilin-eosyne, methylene blue colouring method.

The prelevated samples were set in formaldehyde 10%, and in order to include the sample paraffin was used, thermostating it at 56 degrees for 2 hours. The paraffine blovks were

sectioned using the microtome, and the sections were placed on plates for their histological examination.

The obtained data was manufactured by computer, and their examination was done with the Nikon Labophot 2 microscope.

Histological samples were studied using coloration hematoxylin-eosin and methylene blue. Permanent microscopic preparations were prepared. Their examination was performed with Labophot Nikon type 2. After sampling fragments were fixed in formalin 10% were plugged in containers glass, opaque glass stopper with a flat base, which contained a volume of 10% formalin 100 times higher than the volume harvested fragment.

It was performed on paraffin inclusion of samples. To obtain fragments paraffin blocks they were maintained at room temperature for two days.

Paraffin blocks were sectioned by microtome the resulting the fragments with a thickness of 4-6 μm .

In this way sections were obtained in "ribbon" that were glued on glass slides. These blades have passed through container filled with coloring substances.

RESULTS AND DISCUSSIONS

The inguino-femoral lymphatic center is represented by the superficial inguinal lymph nodes (scrotal in males and retromammary in females) and the subiliac lymph nodes.

The subiliac lymph nodes are represented by a solitary lymph node, placed on the superior border of the tensor fascia latae muscle on the trajectory of the descendent branch of the deep circumflex iliac artery.

This lymph node can be palpated transcutanely. It is ovoidal-shaped, with a length of approximately 2 mm and a width of approximately 1 mm (Fig. 1).

The afferent lymphatic vessels originate from the lateral side of the walls of the abdominal cavity and the lateral side of the calf.

The efferent lymphatic vessels are tributary to the lateral iliac lymph nodes.

The inguinal lymph nodes have a tributary territory which is different according to sex.

In males there are two lymph nodes near the superficial inguinal ring. In females, there are

two to three lymph nodes placed below the last inguinal mammary gland.

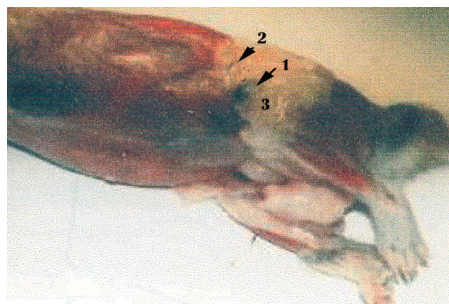


Fig. 1. Subiliac lymph node (original)
1-subiliac lymph node; 2 – deep circumflex
iliac artery 3 – anterior border of tensor of fascia lata

These lymph nodes constantly appear caught within a considerable amount of fat tissue. Their shape is oval, with a diameter of approximately 2 mm.

The afferent lymphatic vessels of the scrotal lymph nodes originate from the foreskin, scrotal bags, penis and ventral abdominal wall.

The afferent lymphatic vessels of the retromammary lymph nodes originate from the glandular parenchyma, the mamelon and the perineal region (Fig. 2).

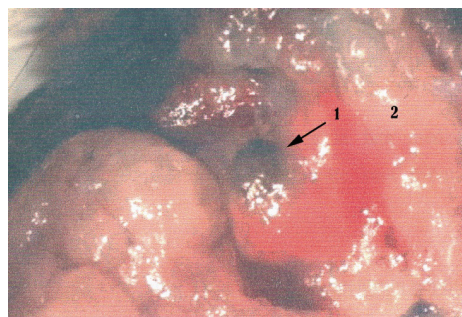


Fig. 2. Superficial inguinal lymph nodes
in females (original) 1 – retromammary lymph nodes;
2 – perimammary fat tissue

In both sexes, the efferent lymphatic vessels are tributary to the medial iliac lymph nodes and the ileofemoral lymph nodes.

The profound inguinal lymphatic center is represented by the ileofemoral lymph nodes.

In this species there is only one lymph node with a dimension of approximately 1,5 mm in diameter on the trajectory of the femoral artery in the femoral trigone.

The afferent lymphatic vessels originate from the medial side of the autopodium. The efferent lymphatic vessels are tributary to the medial iliac lymph nodes.

The popliteal lymphatic center is represented by the popliteal lymph node situated in the popliteal region. This lymph node is placed on the trajectory of the caudal femoral artery. The afferent lymphatic vessels originate on the lateral side of the calf. The efferent lymphatic vessels are tributary to the ileofemoral lymph nodes.

In the subcapsular sinus of the subiliac lymph node there are macrophagi, reticular cells and lymphocytes. A lymphatic vessel which opens in the subcapsular sinus was also noticed (Fig. 3).

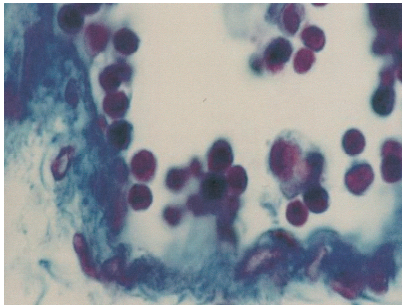


Fig. 3. Subiliac lymph nodes in hamster ob. 20x (original)

By studying subiliac lymph under 100 x lens, in subcapsular sinus was identified a large cell population represented by reticular cells and macrophage (Fig. 4).

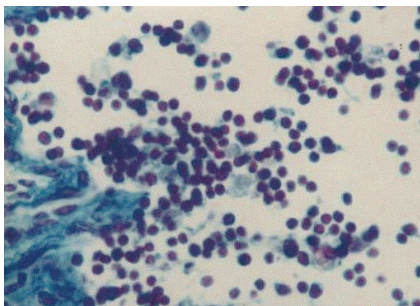


Fig. 4. Subiliac lymph node ob. 100x (original)

Also, it can be seen in the lymphatic sinus subcapsular this lymph node macrophage cells. In subcapsular sinus of the subiliac lymph node using 100x objective and they could detect lymphocytes (Fig.5).

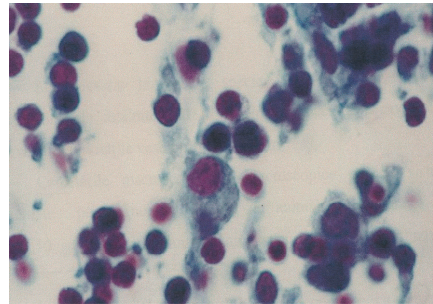


Fig. 5. Subiliac lymph node subiliac ob.100 x (original)

CONCLUSIONS

The popliteal lymphatic center is placed on the trajectory of the caudal femoral artery having a dimension of approximately 1.5 mm in diameter. Superficial inguinal lymph nodes can be palpated transcutaneously in both sexes.

Ischiatic lymph nodes were unapproachable in hamsters.

The lymph nodes have, in their cortical region, lymphoid follicles pushed towards the middle portion of the lymphatic center. The subcapsular sinus is considerably large, having a numerous lymphocyte population. At the medular coordinates and sinuses alike, dendritic cells, lymphocytes, reticular cells and eosynocytes can be found.

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