

Hemolymph Nodes Found In the Iliolumbar Region of a Tail Infected Rat

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Letter to Editor

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Dear Editor

In 1884 Gibbes found some structures containing great amounts of erythrocytes between the renal artery and vein of the human subject [1]. Soon after Robertson (1890) reported that these structures not only existed in the human subject but also in animals, and named them as “hemolymph node” (HLN) [2]. Subsequent studies on rats showed that these nodes were also found between the renal artery and vein. Those researches focused mainly on morphological distribution and structure of HLN, or origin and location of erythrocytes in sinuses [3-7], seldom on the phenomenon of the rosette formation of the macrophage-erythrocyte (ME) and their immunity activities. Although recent article have mentioned that the appearance of HLN was related to immunity, there was no strong evidence to support the perspective [8].

In order to identify the detailed structure/ultrastructure in various types of degenerating lymph nodes, we have currently been examining them in aging rats. During the process, two HLNs were found situated in the left side of the lumbar and the left common iliac arteries of a tail infected rat (Fig 1). Histological and Transmission Electron Microscope (TEM) examinations showed that a large number of rosettes formed by autologous macrophages, erythrocytes and lymphocytes (MEL) were found in sinuses of HLNs. Each rosette was composed of a macrophage in the centre and surrounded by numerous erythrocytes and several lymphocytes (Figs 2 & 3). Macrophages, which contained phagosomes, *extended their pseudopodia around* erythrocytes to engulf them (Fig 3B, 3C). Those rosettes, sat next to/adhered to the wall of the sinus, whose erythrocytes were partially detached from macrophages (Fig. 2, indicated by yellow

arrow heads). However impaired/fragmentary erythrocytes were remaining in sinuses. Macrophages stained in dark brown were seen within the lymph tissue of the node (Fig 2, indicated by green arrow heads).

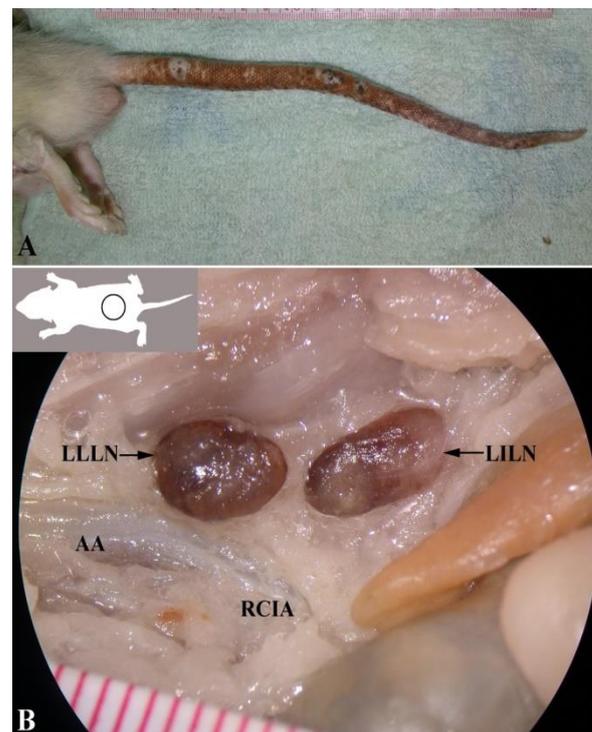


Fig 1: HLNs in the abdomen of a tail infected rat. (A) Infected tail of the rat. (B) HLNs present a dark brown appearance. LLLN = Left lumbar HLN; LILN = Left iliac HLN; AA = Abdominal aorta; RCIA = Right common iliac artery

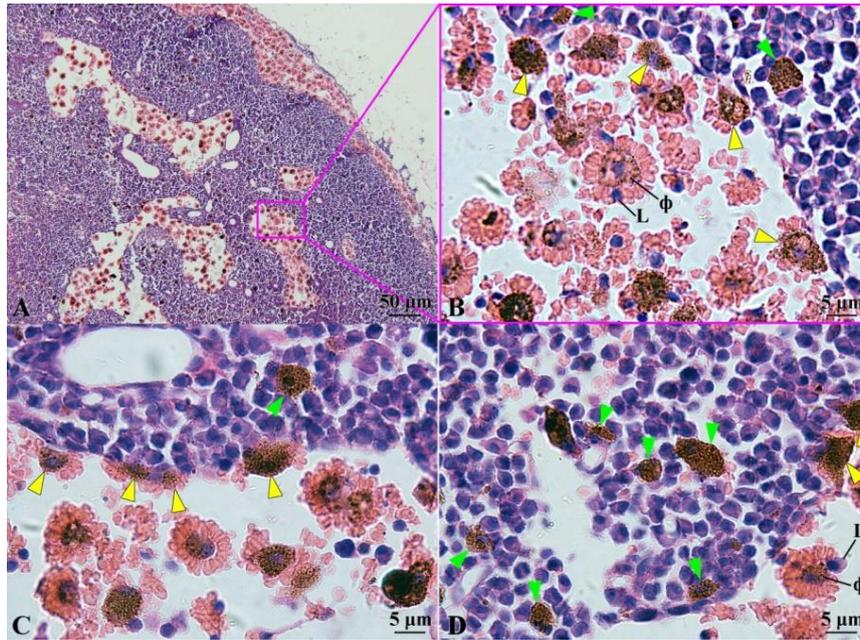


Fig 2: Histological result of HLN (HE stain); (A) Numerous rosettes formed by autologous macrophages, erythrocytes and lymphocytes are situated in sinuses of the left lumbar lymph node of a tail infected rat. (B to D) Magnified images show that a numerous of rosettes in sinuses. Some rosettes, adjacent to or adhered to the wall of the sinus, had erythrocytes that partially detached from macrophages (yellow arrow heads). Macrophages stained in dark brown are presented in the lymph tissue of the node (green arrow heads). ϕ = Macrophage; L = lymphocyte

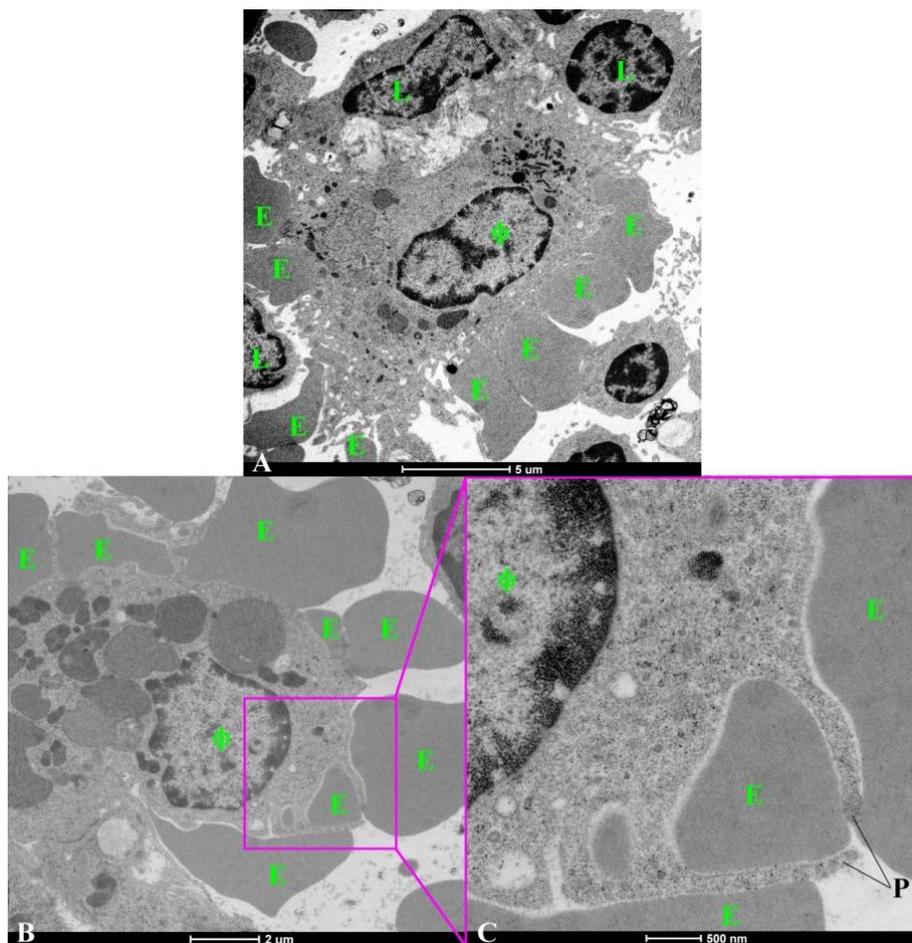


Fig 3: TEM result of HLN. (A) A rosette is composed of a macrophage in the centre and surrounded by numerous erythrocytes and several lymphocytes. (B, C) A macrophage, adhered with surrounding erythrocytes, extends its pseudopodia to engulf the partial body of an erythrocyte. ϕ = Macrophage; E = Erythrocyte; L = Lymphocyte.

Previous studies on HLN of rats were mostly based on the node that situated between the renal artery and vein, and focused mainly on origin and location of erythrocytes or morphological distribution and structure of HLN in sinuses [3-7], seldom on the phenomenon of the rosette formation of the macrophage-erythrocyte and their immunity activities. Our findings have shown that: (1) HLN could be found in the iliolumbar region of a tail infected rat; (2) Cytological changes occurred in MEL rosettes of HLN. Therefore, we tend to believe that the appearance of HLN was a phenomenon of immunological reaction rather than a morphological manifestation. MEL rosettes in sinuses were considered as cellular complexes as part of an immune response. Finally, we considered that further investigations are required to reveal the mechanism of the phenomenon.

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Statement of Ethics

All animal procedures were performed in accordance with the National Institutes of Health Guide for the Care and Use of Laboratory Animals and approved (#L20160302) by the Institutional Animal Care and Use Committee of Xuzhou Medical University (Jiangsu, China).

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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