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The embryonic and early fetal development of the lymphatics of the heart and lungs in humans (25.6.93)

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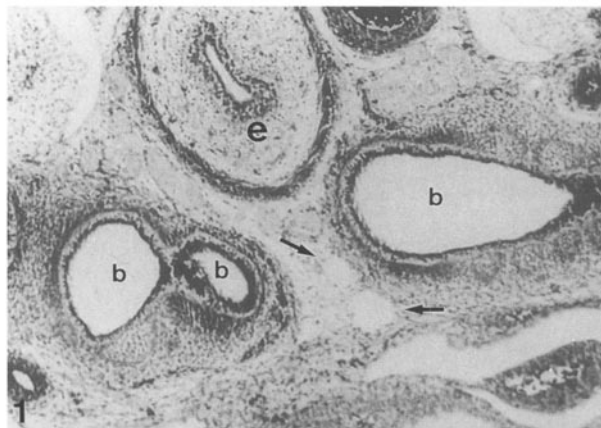
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According to Limborgh [2], paratracheal lymph plexuses appear in the embryo at 13 mm (44 days) and a single primordium appears inferior to the tracheal bifurcation at 22 mm. In order to assess these findings and further study the development of main lymphatics of the heart and lungs, we reviewed 34 embryos and fetuses from the collection of the Laboratoire d'Anatomie de l'UFR Biomédicale des Saints-Pères. Their crown-rump lengths (CRL) ranged from 16.5 mm to 92 mm. They were serially sectioned according to their transverse diameter and the serial sections were one by one studied with the aid of a microscope and photographed in view of graphic reconstruction. We particularly studied the anatomical sites of the tracheal bifurcation, left superior bronchus and pulmonary ligament in order to research lymphatics from the lung, of the right aspect of the trachea for lymphatics from both heart and lung and of the anterior junction between aorta and pulmonary trunk for the heart.

We observed lymphatic vessels as early as 21 mm CRL (Fig. 1), appea-



Figs. 1, 2

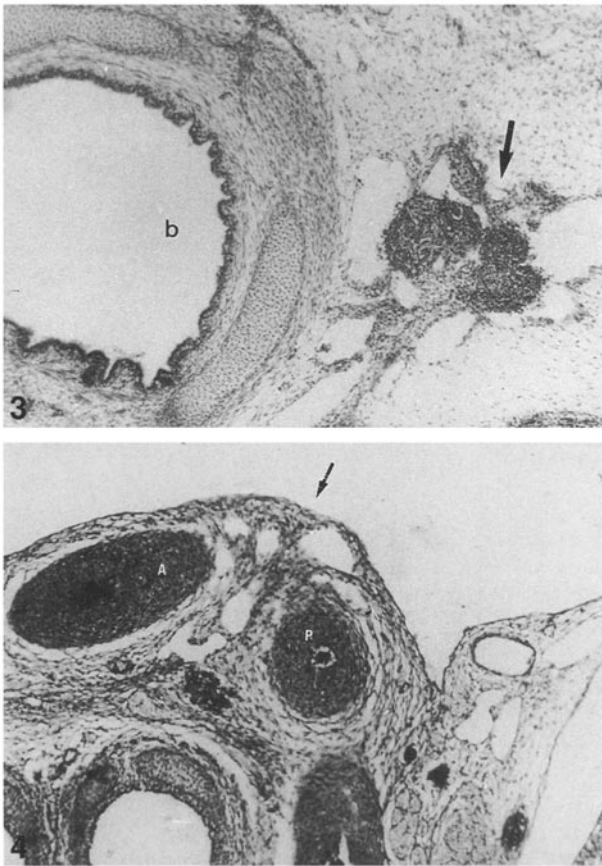
1 Embryo; 22 mm; *e*: esophagus; *b*: bronchus; lymphatic vessels about the tracheal bifurcation (*arrows*), (magnification x10) (col: Loyez). **2** Fetus; 42 mm; *e*: esophagus; *b*: bronchus; Lymphoid cells (*asterisks*) (Mag. x10) (col: Masson)

1 Embryon de 22 mm; *e*: oesophage; *b*: bronche souche; vaisseaux lymphatiques au niveau de la bifurcation trachéale (*flèches*) (grossissement x10, coloration Loyez). **2** Foetus de 42 mm; *e*: oesophage; *b*: bronche, tissu lymphoïde (*asterix*) (grossissement x10, coloration Masson)

range of lymphoid tissue between 33.5 and 42 mm CRL (Fig. 2) and lymphnodes were present between 69 et 70.5 mm CRL (Fig. 3) and were

perfectly formed at 92 mm.

Lymphatic vessels, lymphoid tissue and lymphnodes appeared at the same time in all areas studied, except



Figs. 3, 4

3 Fetus; 70.5 mm; *b*: bronchus; nodes within lymphatic vessels (*arrows*) (Mag. x10; col: Morel and Bassal). **4** Embryo; 27 mm; right lymphatic collection of the heart (*arrows*); *A*: aorta; *P*: pulmonary trunk (Mag. x10; col. Trichrom)

3 Foetus de 70,5 mm; *b*: bronche; noeuds au niveau des vaisseaux lymphatiques (*flèches*) (grossissement x10, coloration Morel et Bassal). **4** Embryon de 27 mm, collecteur lymphatique droit (*flèche*) *A*: aorte, *P*: tronc de l'artère pulmonaire (grossissement x10, coloration trichrome)

at the junction between the aorta and the pulmonary trunk which remains without lymphoid tissue even in adult life (Fig. 4).

Our findings compare with the development of paratracheal vessels already observed [2] and vessels and nodes previously photographed in other anatomical regions [1].

The lymphatic system of the heart and lungs is established at the end of embryonic life and is complete by early fetal life. This period corresponds to that considered as embryonic growth by Pineau [3] who thought that fetal life and growth begin at 98 mm CRL.

References

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