

THE SENSORY NERVE TERMINATIONS IN THE BLOOD VESSELS OF THE EXTREMITIES

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The existence of pressoreceptors in the walls of the carotid sinus and the aortic arch has been recognized by many investigators. But we have found hardly any report on the sensory end organs in the blood vessels of the extremities except on those of encapsulated structures. Truex (1936)¹⁾ alone described sensory nerve terminations to exist in the walls of arteries and veins of the forelimb of the cat.

The author found sensory terminations, which were assumed pressoreceptors, in the adventitia of the posterior tibial artery obtained from an amputated leg of a man.

METHOD

The materials were stained by the Bielshowsky-Araki's impregnation method²⁾ after fixation in 10% formol solution.

RESULTS

Two thick myelinated nerve fibers were seen running longitudinally in the adventitia of the posterior tibial artery. Their branches emerging from myelin sheath ramified more complexly, and in such case the branches often joined with each other, or terminated freely (Fig. 1, 2). Their terminations did not show fibril terminal plates.

Arterioles and small special cells existed in the area of these terminations.

DISCUSSION

The sensory nerve terminations in the carotid sinus and aortic arch known as pressoreceptors connected with Hering's falling reflex have been investigated by de Castro (1829),³⁾ Sunder-Plassmann (1930),⁴⁾ Nonidetz (1935),⁵⁾ Seto (1937),⁶⁾ Stöhr, jr. (1938)⁷⁾ and others. Seto (1936)⁸⁾ and Aiba (1954)⁹⁾ described the sensory terminations of the human heart.

Abraham (1953)¹⁰⁾ further found three kinds of special nerve endings and organs in the walls of the renal artery, and assumed that they might play the same role as the above-mentioned pressoreceptors.

Truex (1936)¹⁾ reported on the end organs in the walls of the arteries and

veins and perivascular tissues of the forelimb of a cat, and stated that these end organs were morphologically similar to some of those described by Sunder-Plassmann (1930)⁴⁾ in the carotid sinus, and those described by Larsell and by Larsell and Dow in the respiratory tract.

Sasaki (1943),¹¹⁾ Matsumoto (1950),¹²⁾ Koizumi (1953)¹³⁾ and Jabonero (1958)¹⁴⁾ described pressoreptoric nerve endings in the larynx. On the other hand Sunder-Plassmann (1933),¹⁵⁾ Sasaki (1943),¹⁶⁾ Nagaishi and Inaba (1958)¹⁷⁾ described those in the trachea and bronchus. However Jabonero (1958)¹⁴⁾ stated that the sensory end organs (Fig. 11, his report) were not pressoreptoric nerve endings in spite of their resemblance, because they existed in the perichondrium of the epiglottis and had no relation with the blood vessels.

Seto (1937)⁶⁾ divided pressoreptoric nerve endings of the aortic arch into two classes. I-type is characterized by arborization, the terminations of which always remain as fine terminal nets. In II-type, the terminal structures are not always arborizations, but are often irregularly ramified and the branches join each other or terminate freely.

The end organs found by the author are similar to II-type. These terminations branching complexly in the adventitia of the posterior tibial artery are assumed to be pressoreptoric nerve endings connected with Hering's falling reflex of blood pressure, because these sensory terminations are morphologically similar to those of the carotid sinus and the aortic arch, and the generalized distribution of pressoreceptors throughout the systemic circulation is inferred physiologically.¹⁸⁾

SUMMARY

The author found sensory nerve terminations in the adventitia of the posterior tibial artery obtained from an amputated leg of a man. These sensory terminations ramified complexly, and seemed to be pressoreptoric nerve endings connected with Hering's falling reflex of blood pressure.

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EXPLANATION OF FIGURES

- FIG. 1. The sensory nerve terminations in the adventitia of the posterior tibial artery.
×400.
- FIG. 2. High magnification of the left lower region of Fig. 2. ×1000.

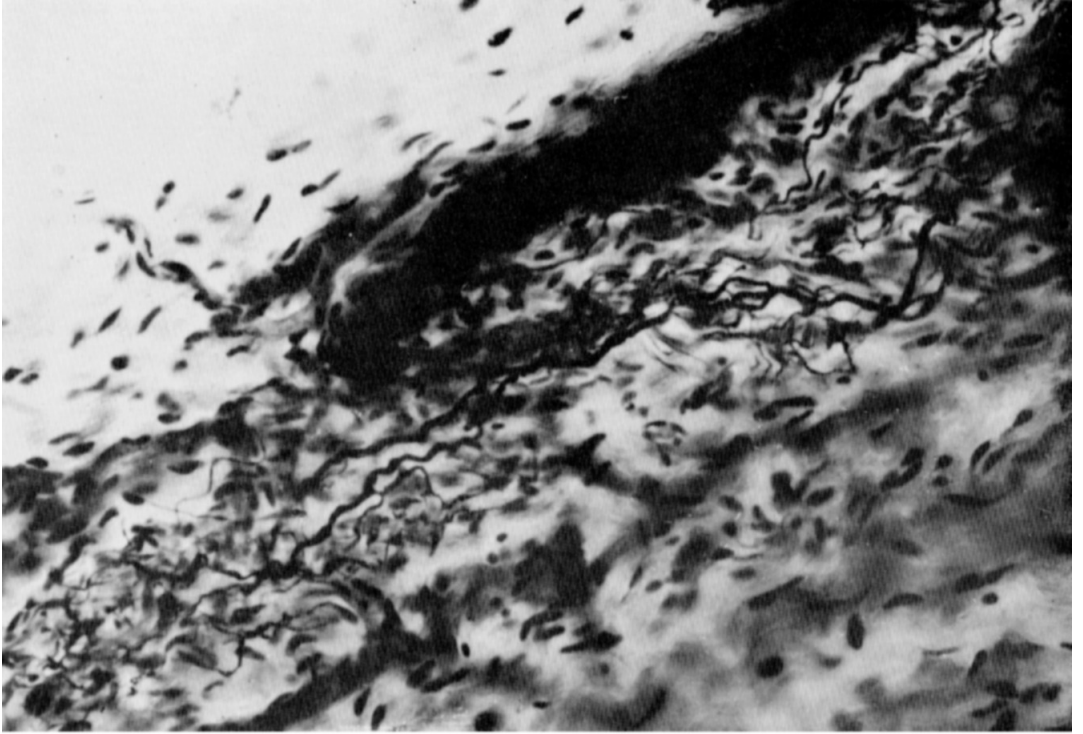


FIG. 1

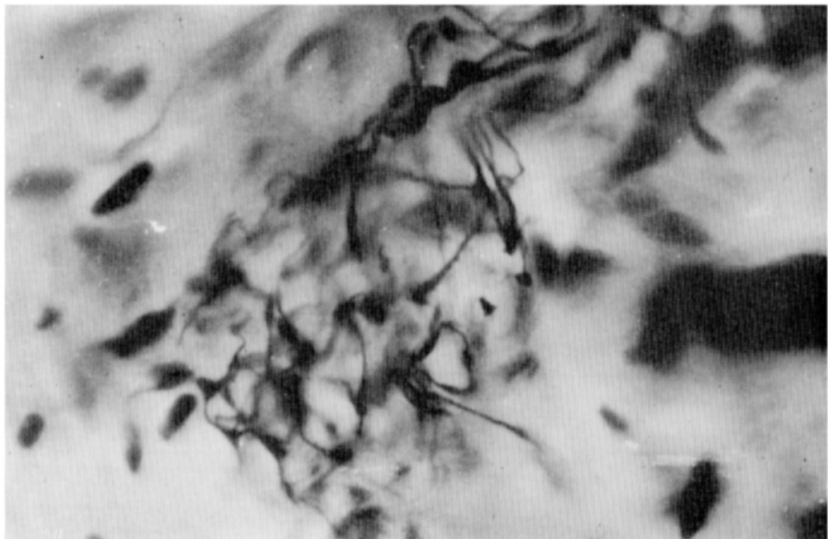


FIG. 2