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Normal morphology of biologically active point BAP/ST36 rat.

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Point ST 36 is one of the most important and most commonly used in acupuncture biologically active point (BAP) [3] The purpose of this study is using the classic histological techniques to visualize normal morphology in the BAP ST 36 in rat. The methods used allow the study of normal anatomic structures in the BAP ST 36 – dermis, subcutis, fascia, muscle, blood vessels and nerves. The observed differences are in the thickness of the dermis and subcutis, loose connective tissue layer, the presence of indentations and differences in the thickness of the epidermis. Larger blood vessels could be found in depth in the underalaying striated muscle tissue, clusters of mast cells in certain areas of the dermis, subcutis, fascia and striated muscle.

Key words: acupuncture, biologically active point (BAP), histology, rat, ST 36.

Introduction

ST36 is one of the most important [2] and the most commonly used acupuncture in BAP [11].To establish any changes in it after acupuncture its normal morphology should be known.

Aim and objectives

The aim of this study is to establish the normal morphology of BAP ST 36 in rat by using a classic histological techniques [12].

Materials and Methods

Experiments

Were carried out on 14 normotensive rats, Wistar strain of either sex weighing 220-350 g and 7 adult spontaneously hypertensive rats, (SHR) of both sexes, weighing 180 to 320 g. The point ST 36 is localized by determining the ratio of standard anatomical structures [3, 4] and with device KWD-808 to measure the skin resistance.

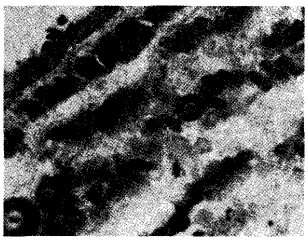
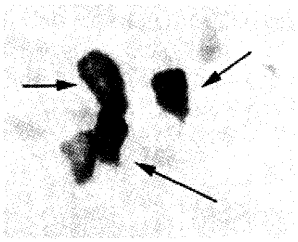
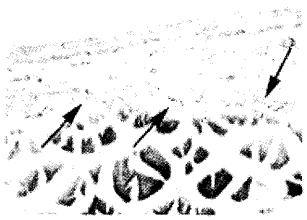


Fig. 1. Skin, subcutaneous adipose tissue (Sudan III)

Fig. 2. Dermis (A), subcutis (B), fascia (C), muscles D) (V.G)





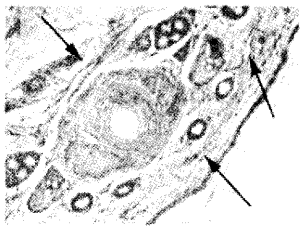
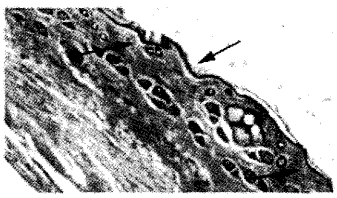
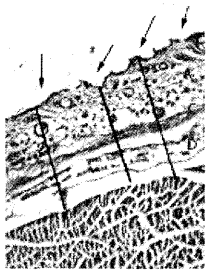


Fig. 3, 4. Mast cells (arrow) (toluidine blue) Fig. 5. Elastic fibers (arrow)





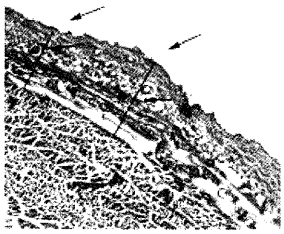
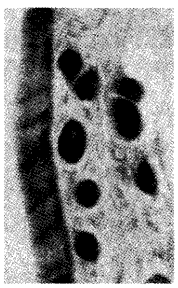


Fig. 6. Skin, Indentations and Fig 7. Dermis (A), subcutis (C), Fig. 8. Dermis (A), muscles (B), differences in the thickness of fascia(D), muscles (B) fascia(C), (arrow-
the epidermis (arrow) (HE) (arrow-differences in the in the thickness of the
thickness of the dermis and dermis and subcutis)
subcutis) (Mallory) (Masson)



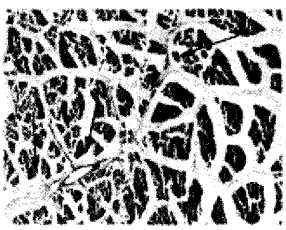


Fig. 9. Free nerve endings Fig 10. Cluster of large blood (Bodyan) vessels (arrow) (Masson)

The material is cut into freezing microtome with a thickness of 20 to 30 mm, and paraffin cut – thickness 5, 7 and 10 μm. Eight different types of staining is applied.

Hematoxylin-eosin (H&E); for the connective tissue- van Gieson (VG); three colour staining by Mallory; Toluidine blue for mast cells; elastic fibers with Orcein; Bodyan for nerve fibers;three colour staining by Masson; Sudan III for fat tissue.

Results

Normal anatomical structures was visualized [5]: skin, subcutaneous adipose tissue in **Fig 1**, fascia, striated muscles, blood vessels and nerves. **Fig 2** and accumulation of mast cells in certain areas **Fig 3, 4**. In the connective tissue [8, 9] elastic fibers are found around the glands, the hair follicles **Fig. 5** and fascias and collagen fibers also. In some areas of the skin we see a thicker layer of loose connective tissue, indentations and differences in the thickness of the epidermis and folding of the deep fascia. **Fig 6, 7, 8** Around the glands and the hair follicles free nerve endings are found [1], **Fig 9** and in the depth of the cross-striated muscle – a cluster of large blood vessels **Fig 10**.

Discussion

In BAP ST36 we observe an accumulation of mast cells, primarily – in the vicinity of blood vessels and the deep fascia, which is confirmed by other authors [7, 10]. Big blood vessels are not detected superficially, unlike earlier studies [6], and we find such in striated muscle[2].

Conclusion

Under normal conditions there is a difference between the normal structure in BAP and the adjacent tissues, but this difference is not pronounced.

References

1. Banes, A.J., Tsuzaki, M., Yamamoto, J., Fischer, T., Brigman, B., Brown, T. and Miller, M. (1995). Mechanoreception at the cellular level: the detection, interpretation and diversity of responses to mechanical signals. Biochem Cell Biol. 73, 349-365.
2. Dimitrov, N., N. Pirovski, D. Sivrev. Application of aiurveda and traditional chinese medicine in the present medical practice. Scientific conference with international participation, scientific researchers volume III, part I, 2008, 346- 350.
3. Dimitrov, N., D. Sivrev, Y. Staykova, Z. Goranova. Comparative analysis of biological active channeles in humans and animals. Scientific conference with international participation, scientific researchers volume III, part I, 2008, 351- 357.
4. Dimitrov. N., D. Sivrev D, N. Pirovski, A. Georgieva, Methods for localization of BAP of the human body. 19-21.Jurnal of Biomedical &clinical Research, MU – Pleven, 2009
5. Dung, H.C. (1984). Anatomical features contributing to the formation of acupuncture points. Am J Acup. 12, 139-143.
6. Jeong, K., P. Min, C. Kuang, J. Hae. Histological Changes of the Acupoint by Acupuncture Stimulation. Korean Journal of Electron Mycroscopy, 2000, 30(1): 81-87.
7. Kurabayashi, Y. Histological studies on the skin elective resistance decreased point (SERDP). Okayama Igakukai Zasshi. 1980, 92: 635-657.

8. Langevin, H.M., Churchill, D.L., and Cipolla, M.J. (2001). Mechanical signaling through connective tissue: a mechanism for the therapeutic effect of acupuncture. FASEB J, 15, 2275-2282.
9. Langevin, H., D. Churchill, J. Wu, G. Badger, J. Yandow, J. Fox, M. Krag. Evidence of Connective Tissue Involvement in Acupuncture. The FASEB Journal, 2002,
10. Yung-Kyoung, Y., H. Lee, K. Hong, Y. Kim, B. Lee. Electroacupuncture at acupoint ST36 reduces inflammation and regulates immune activity in Collagen-induces Arthritic mice. eCAM, 2007, 4(1): 51-57.
11. Лувсан, Г. Традиционные и современные аспекты восточной рефлексотерапии, Наука, Москва, 1992 (in Russian)
12. Чучков, Хр., Д. Сиврев, М. Недева. Хистологични техники. Универс прес, 2007.