قســـــــم التشريح ـ كلية الطب البيطـرى ـ جامعة أســيوط.
رئيس القسم : د / عبد الله حفنى طـــه.

المدد الدموى الشريانى للأصـــــابع فـــــى الجمل وحيد السنام

حلمى بدوى ، أحمد قناوى ، أشـــرف صبحـــــــــــى

يعتبر الشريان الأخمصى العام الخاص بالاصبع الثالث هو الوعاء الرئيسى المغـــــــــذى للأصابع فى الجمل . هذا ويعتبر هذا الشريان هو الامتداد المباشر للفرع الذيلـــــــــى للشريان الصافن . كما أن الشريان الأخمصى العام بالاصبع الثالث ينقسم عند مســـــــــتوى النصف العلوى للسلامية الاولى الى الشريان الاخمصى الخاص بالاصبع الثالث المحورى والشريـان الخاص بالاصبع الرابع المحورى وكل من الأخيرين يعطى بدوره الشريان الأخمصى الخاص بالاصبع الثالث الغير محورى والشريان الأخمصى الخاص بالاصبع الرابع الغير محورى .

Dept. of Anatomy & Histology,
Faculty of Vet. Med., Assiut University,
Head of Dept. Dr. A. Hifny.

THE ARTERIAL SUPPLY OF THE DIGITS IN THE ONE-HUMPED CAMEL (CAMELUS DROMEDARIUS)

(With 2 Figurs)

By

H. BADAWI, A.K. AHMED and A.S.M. SABER

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SUMMARY

The terminal branches of R.caudalis of A.saphena, as the main arterial supply of the hind foot in Camel, have been examined. The origin, Course and distribution of the digital branches also have been studied. The main differences between the digital arteries in Camel and other ruminant animals were described.

INTRODUCTION

The arterial blood supply of the fore-foot and digits in the one-humped camel was studied by ALY (1974). The digital arteries were also examined by HABEL (1950); McCLEOD (1958), WILKENS and BADAWI (1962), GHOSHAL and GETTY (1968 b) and GHOSHAL (1975) in Cattle. Moreover, the blood supply of the digits was also studied by SALAMANCA and SCHWARZ (1960) in goat, and FREYTAG (1962) in sheep.

MATERIAL and METHODS

The present study was carried out on 20 hind feet of the single-humped (Camelus dromedarius) of both sexes and of different ages. The feet were injected with coloured Latex through the caudal branch of the sapheneus artery. Moreover 10 other feet were injected with plastoid and treated according to the method of SCHUMMER (1951). The Nomenclature adopted by NOMINA ANATOMIC VETERINARIA (1973) have been used in the present stuyd.

RESULTS

The caudal branch of A.saphena continues its distalward Course caudal to the Flexor tendons of the digit as A.digitalis plantaris communis III.

The third plantar common digital artery (1,2/1) terminates by dividing into Aa.digitales plantares propria III et IV axiales (1,2/2). Both descend along the axial border of each corresponding digit to reach the level of the distal inter-phalangeal articulation where they terminate as Rr.dorsales III et IV axiales. Nearly opposite to the proximal third of the proximal phalanx, the axial third and fourth plantar proper digital arteries detach the abaxail third and fourth plantar proper digital arteries.

The abaxial third and fourth plantar proper digital arteries (1,2/3) cross the plantar surface of the proximal phalanx to gain its abaxial border then continue distally along the abaxial border of each corresponding digit. As they reach the apex of the distal phalanx, they terminate as Rr.dorsales III et IV abaxiales.

Each of the axial and abaxial plantar proper digital arteries of the third and fourth digits detaches the following branches.

R.articularis:

An articular branch (1/7; 2/10) is detached from the initial part of the parent vessels to vascularize the metatarsophalangeal articulation and sesamoid bones.

R.plantaris phalangis proximalis:

The plantar branch of the proximal phalanx (2/4) is given off either separately or by a stem vessel with R.dorsalis phalangis proximalis at a level of either the middle or the distal third of the proximal phalanx. It traverses the plantar surfac of the latter phalanx to anastomose with its corresponding branch.

R.dorsalis phalangis proximalis:

The dorsal branch of the proximal phalanx arises either separately or in common with the plantar branch. It ascends for about 0.5 cm then divides into a proximal and a distal branch. Only in one dissected case, the two branches arose separately from A.digitalis plantaris propria III abaxialis. The proximal branch ascends along the abaxial border of the proximal phalanx to reach its proximal extremity where it is distributed to the flexor tendons, the insertion of M.interosseus medius,the dorsal aspect of the metatarsophalangeal articulation and anastomoses with that of the other side.

The distal branch gains the dorsal aspect of the proximal phalanx and divides into two branches which anastomose with those of the other side and supply the periostium and the bony substance of the proximal phalanx. In addition, the distal branch detaches the nutrient artery of the proximal phalanx.

R.plantaris phalangis media:

The plantar branch of the middle phalanx (2/5) is given off either separately or by a stem vessel with the dorsal branch of the middle phalanx, at the level of the middle of the bone. It crosses the plantar surface of the bone to anastomose with the corresponding branch of the other side. It vascularizes the plantar surface of the corresponding phalanx and the proximal interphalangeal joint.

R.dorsalis phalangis media:

The dorsal branch of the middle phalanx divides into a proximal and a distal branch. The proximal branch detaches the nutrient artery of the middle phalanx and several twigs for the proximal interphalangeal articulation. It also anastomoses with that of the other side. The distal branch joins the corresponding one of the other side and detaches 3-4 twigs for the periosteum and the distal extremity of the middle phalanx.

Rr.toricae digitales:

These are 13-20 branches (1/4) which are detached at 0.3-2.5 cm intervals. They insinuate between the fibrous (external) and the elastic (internal) layers of the common covering of the foot-pad. They divide in a dichotomic manner to form a network of vessels to supply the foot-pad and its common covering and the yellow pad at the heel.

Aa.coronales:

The coronary arteries cross the distal interphalangeal articulation from the abaxial to the aixal border to join the axial third or fourth plantar proper digital arteries. They supply the ungual fold of the nail.

Rr.dorsales III et IV axiales and abaxiales:

The axial and abaxial dorsal branches form the terminal branches of the axial and abaxial third and fourth plantar proper digital arteries. They anastomoses with each other forming an arterial plexus terminalis (1/5; 2/6) which embraces the distal phalanx. The dorsal branches vascularize the distal interphalangeal articulation and one of them gives off the nutrient artery of the distal phalanx.

DISCUSSION

The main arterial supply of the digits in camel is similar to that stated by WILKENS and MUNSTER (1976) in Cattle. SALAMANCA and SCHWARZ (1960);FREYTAG (1962) and WILKENS and BADAWI (1962) stated that the main arterial supply to the digits of goat, sheep and cattle were derived from A.metatarsica dorsalis III which continues as A.digitalis pedis communis III dorsalis.

The digits of the camel have A.coronaria which originates from Aa.digitales plantares propriae III and IV abaxialis.

In goat and sheep the coronary arteries arise from A.digiti pedis III lateralis and A.digiti pedis IV medialis as mentioned by SALAMANCA and SCHWARZ (1960) and FREYTAG (1962).

According to WILKENS and BADAWI (1962) the Aa.Coronales in cattle were detached from A.digiti pedis III plantaris lateralis and A.digiti pedis IV plantaris medialis, while WILKENS and MUNSTER (1976) stated that the coronary arteries in cattle arise from A.digitalis plantaris propria III et IV axiales.

ALY (1974) mentioned that Aa.coronales in the digits of thoracic limbs of camel were not formed, while the present invistigation showed that Aa.coronales are well developed in case of pelvic limb.

The Arcus terminalis described in cattle by WILKENS and BADAWI (1962) as well as WILKENS and MUNSTER(1976) and that described by ALY (1974) in the digits of the throacic limb in camel could not be demonestrated in the pelvic limb of camel.

REFERENCES

Aly, M.A. (1974): The vasculature of the fore-feet of the camel. Thesis, Fac. of Vet. Med., Zagazig University.

Freytag, K. (1962): Arterien und Venen an der Beckengliedmasse des schafes. Tierarztl. Hochsch., Diss. Med. Vet., Hannover.

Ghoshal, N.G. and R. Getty (1968 b): The arterial blood supply to the appendages of the ox (Box taurus). Iowa state J. Sci., 43 (1), 41-70.

Ghoshal, N.G. (1975): Ruminant heart and arteries. Pelvic limb. In: S. SISSON and J.D. GROSSMAN : Anatomy of the domestic animals. Vol. 1, 5th ed. W.B. Saunders Comp., philadelphia-London.

Habel, R.E. (1950): The nerves and arteries of the bovine foot. Amer. Vet. Med. Ass. 87-88 : 323-327.

NOMINA ANATOMICA VETERINARIA (1973): Published by the international Committes on Veterinary Anatomical Nomenclature, Vienna.

Salamanca, M.E. DE, & R. Schwarz (1960): Die Arterien an der Beckengliedmasse der Ziege. Wiener Tierarztliche Monatsschrift, 102-114.

Schummer, A. (1951): Vereinfachtes plastoid-korrosionsverfahren. Anat. Anz. 98, 288-290.

Wilkens, H. & H. Badawi (1962): Beitrage zur arteriellen Blutgefassversorgung vom fuss der Beckengliedmasse des Rindes. Berl. Munch. tierarztl. Wschr. 75, 471-476.

Wilkens, H. and W. Munster (1976): Arterien und venen in : R. Anatomie der Haustiere. Ed. 3. Verlag P. parey, Berlin-Hamburg.

LEGENDS

Fig. (1): Plastoid cast of the digital arteries of the left foot.
1- A. digitalis plantaris communis III, 2- Aa. digitales plantares propriae III, IV axialis,
3- Aa. digitales plantares propriae III, IV abaxialis,
4- Rr. toricae digitales, 5- plexus terminalis,
6- A. metatarsea plantaris III, 7- Rr. articulares.

Fig. (2): Diagram showing the digital arteries.
A- Os metatarsale III et IV B- Ossa sesamoidea proximalia
C- Phalanx proximalis D- phalanx media
E- phalanx distalis.
1- A. digitalis plantaris communis III 2- Aa. digitales plantares propriae III, IV axialis,
3- Aa. digitales plantares propriae III, IV abaxialis,
4- Rr. plantares phalangis proximalis, 5- Rr. plantares phalangis media,
6- Plexus terminalis, 7- A. metatarsea plantaris III,
8- A. metalarsea plantaris II, 9- A. interdigitalis,
10-Rr. articulares.

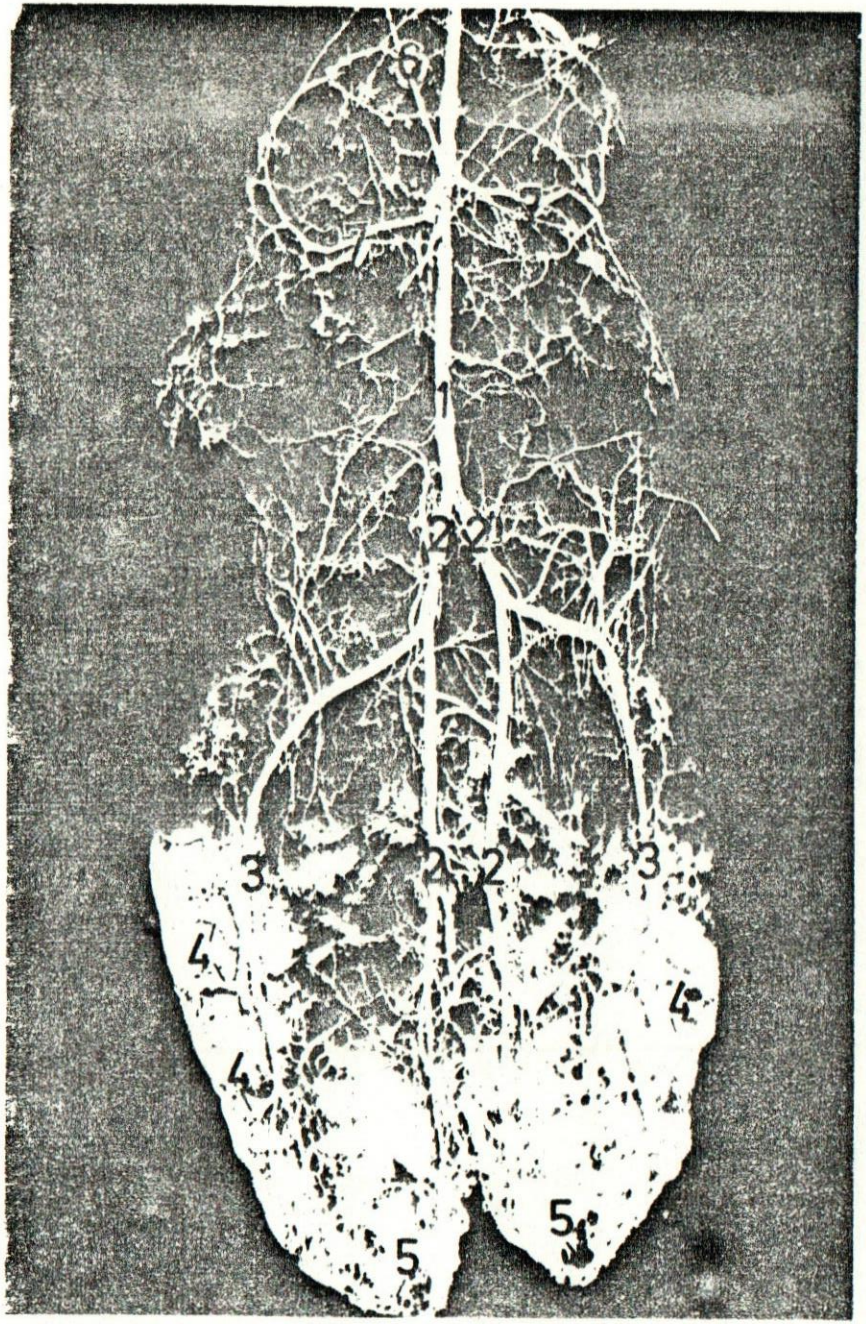

Fig. 1

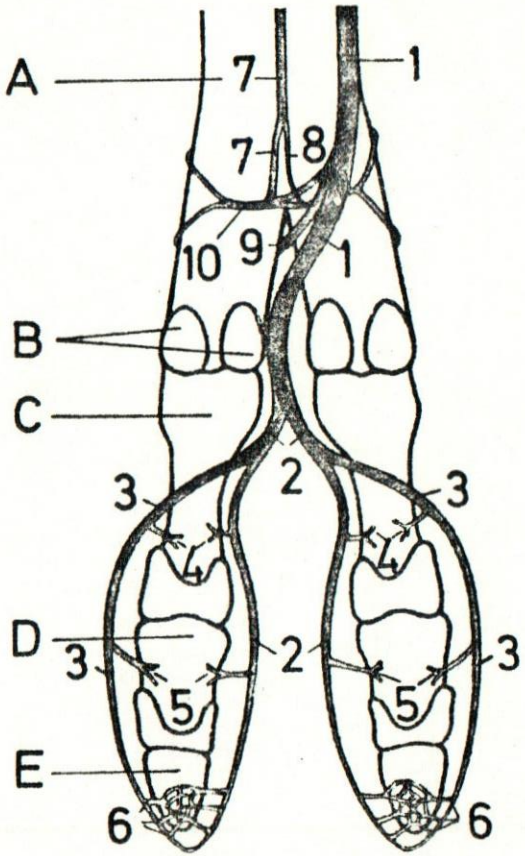

Fig. 2