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SOME ANATOMICAL STUDIES ON THE LUMBOSACRAL PLEXUS IN THE FOX (ALPOX LAGAPUS)

(With 6 Fig.)

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بعض الدراسات التشريحية على الضفيرة القطنية العجزية للثعلب

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أجرى هذا البحث على عدد عشرة أرجل خلفيه لثعالب مختلفة الجنس والعمر وتم تجهيز العينات وحفظها بواسطة محلول فورمالين ١٠% يحتوى على ١% جلسرين ثم شرحت العينات تشريحاً دقيقاً لدراسة منشأ وتوزيع أعصاب هذه الضفيرة هذا وقد لوحظ أن هناك اختلافات فى تكوين هذه الضفيرة عما سجل من قبل فى الكلاب حيث وجد ان أنها تتكون من الأفرع البطنية للأعصاب القطنية الرابع والخامس والسادس والسابع والعصب العجزى الأول والثانى وكذلك وجدت بعض الاختلافات فى منشأ وتوزيع الاعصاب التى تخرج من الضفيرة وقد تم تسجيل هذه الاختلافات ومناقشتها مع مثيلاتها فى القطط والكلاب والخنزير من المراجع المتاحة .

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SUMMARY

The present work was carried out on ten pelvic-limbs of foxes. The animals were thoroughly bled and injected by 10% formaline and 1% glycerine solution. The limbs were carefully dissected. The obtained results revealed that, the nerves of the hind limbs originate from the ventral branches of the last four lumbar and first two sacral nerves. The *N. cutaneus femoris lateralis* was derived from L4 while the *Nn. femoralis* and *obturatorius* originate from L4, L5 and L6. The *Nn. gluteus cranialis* and *caudalis* are derived from L6, L7 and L7, S1 respectively. The sciatic nerve originates from L6, L7, S1 and S2 while *N. cutaneus femoris caudalis* is originated from S1 and S2. The course and distribution of each nerve were described in details and discussed with the canines and felines.

Keywords: Anatomy, lumbosacral plexus, fox.

INTRODUCTION

The foxe as a wild animal takes recently a great attention from the veterinary investigators (AWAD, NOSSEUR, ATTIA and EIDAROOS, 1990) and (AHMED, NOSSEUR, ABD EL-AZIZ and ATTIA, 1990). This is due to its great importance as a zoo animal and as a source of highly economic value hide as well as its role in the disease transimition. The object of this work is to describe in detail the origin, course and distribution of the nerves of the lumbosacral plexus which supply the pelvic limb in the fox. Such study will fill a gape in the field of comparative anatomy and is used as a guide in application of the local anaesthesia during the surgical interference in the pelvic limb of the fox.

MATERIAL and METHODS

The pelvic-limbs of the foxes of different age and sex were used in this work. The animals were scarified and injected with 10% glycerine solution via the *A. Carotis communis*. After three days, the limbs were seperated with the lumbar, sacral and caudal parts of the vertebral column and bisected symetrically. A careful dissection of the origin, course and

distribution of the nerves of the lumbosacral plexus were carried out. Glacial acetic acid and magnifying lenses were used to clarify the fine branches. The Nomenclature used in this work was that adopted by the N.A.V. (1993) as it was possible.

RESULTS

N. Cutaneus femoris lateralis

The lateral cutaneous femoral nerve (1/7, 4/7) originates from the ventral branch of the 4th lumbar nerve. The latter nerve arises from the spinal cord at the level between 3rd and 4th lumbar vertebra and passes ventro-caudally in the vertebral canal for 1-1.3 cm to emerge from its intervertebral foramen. The ventral branch divides into two ramia. One of them passes caudally for 2-2.5 cm in the substance of the *M. psoas major* to connect with the ventral branch of 5th nerve. The second one represent the continuation of the ventral branch. It passes caudoventrally as *N. cutaneus femoris lateralis* between the two psoas muscles, then curves laterally around the *M. iliopsoas*. In one specimen the nerve received a small root from the ventral branch of 3rd lumbar nerve. The nerve perforates the abdominal muscles ventral to the level of the caudal end of the 6th lumbar vertebra, then continues ventrally in the fascia latae along the cranial border of the *M. tensor fasciae latae* to end in the skin and subcutaneous fascia of the cranial aspect of the thigh and cranial and lateral aspects of the stifle and proximal part of the leg. In the first part of its course, it gives off cutaneous branches to the cranial aspect of the thigh.

N. Femoralis:

The femoral nerve (1/8, 4/8) emanates from the ventral branches of the 4th, 5th and 6th lumbar nerves, the largest one is that of the 5th lumbar nerve. This nerve originates from the fifth lumbar segment at the junction of 4th and 5th lumbar vertebrae and passes caudoventrally for 1.5-1.8 cm to emerge through intervertebral foramen. The ventral branch connects with the root of 4th lumbar nerve and continues caudally in the substance of the *M. iliopsoas* for about 1.2-2 cm to join the root of the sixth lumbar nerve and divide into the femoral and obturator nerves. The femoral nerve passes caudoventrally in the latter muscle for about 1.5-2 cm, giving it small muscular twigs after that, the nerve gives of the *N. saphenous* and muscular branch to the *M. sartorius*. The latter enters the two divisions of that muscle proximally by the two rami, then the

femoral nerve enters between the *M. vastus medialis* and *M. rectus femoris* where it divides into 4-5 muscular branches distributed in the cranial muscles of the thigh in the following manner:

- Muscular branch enters the *M. rectus femoris* at its proximal end by two branches. One of them send a small twig to *M. articularis genuis*.
- The second branch continues distally deep to the *M. rectus femoris* and between the *M. vastis intermedius* and *M. vastus lateralis* till the middle of the thigh where it ends in the latter muscle, it gives off muscular twigs to the former muscle at its proximal part.
- The third branch enters the *M. vastus medialis* at its proximal end. Its also gives off three muscular twigs pass to the *M. vastus intermedius*. One of them continues distally in its substance where it ends in the *M. articularis genuis*.

N. Saphenus:

The saphenous nerve (4/15) arises from the *N. femoralis* as the latter leaves the *M. iliopsoas*. It passes distally in the femoral triangle cranial to *A. femoralis*. After that it crosses the *M. adductor* obliquely and continues with the saphenous vessels subcutaneously on the medial aspect of the leg. On the different levels along the proximal third of the leg the saphenous nerve divides into *R. cranialis* and *R. caudalis*. As the nerve courses on the medial aspect of the thigh and stifle, it gives off several cutaneous branches to these regions and medial aspects of the proximal part of the leg as well as the capsule of the stifle joint.

- The *R. cranialis* of the *N. saphenus* (4/17) continues cranio-distally to cross the medial aspect of the leg and courses along the dorsal medial aspect of the tarsus where it distributes by several cutaneous branches to the skin and fascia of the dorsomedial aspect of the tarsus and metatarsus till the proximal end of the digits. Some of these twigs are connected with branches of superficial peroneal nerve. It also detaches rami cutanei to the craniomedial aspect of the leg.
- The *R. caudalis* (4/18, 5/18) continues distally with the caudal branch of the saphenous artery where it divides into two branches in the distal third of the leg, those redivided into several cutaneous twigs which distribute in the medial aspect of the leg, tarsus and proximal part of metatarsus.

N. Obturatorius:

The obturator nerve (1/9, 4/9) takes its origin from the ventral branches of 4th, 5th and 6th lumbar nerves as the N. femoralis. It passes caudoventrally crossing the rostral portion of the *M. obturatorius internus* then penetrating it to continue on the pelvic surface of the pubis. The nerve passes outside the pelvic cavity through the cranial portion of the obturator foramen. At its emergence, the obturator nerve detaches a muscular branch to the *M. obturatorius externus* and passes ventromedially between the *M. pectinues* and *M. adductor* for about 0.5-1.0 cm where it divides into three muscular branches. The smallest of them enters the *M. pectineus* in its caudal aspect. The second one penetrates through the *M. adductor* at the proximal third of its cranial aspect, while the third branch represents the continuation of the parent nerve, turns medially around the proximal third of the *M. adductor* and passes caudoventrally between the latter muscle and the *M. gracilis* to end by two branches in the latter muscle.

N. Gluteus cranialis:

The cranial gluteal nerve (2/1, 4/11) derives its fibers from the ventral branches of the 6th and 7th lumbar nerve. These two lumbar nerve pass caudally in the vertebral canal for about 2 cm. The ventral branch of the former gives off a small root to the femoral and obturator nerves and passes caudoventrally in the iliopsoas muscle for about 2.0 cm to connect with the ventral branch of the 7th lumbar nerve to form the lumbosacral trunk which gives the *N. gluteus cranialis*. The cranial gluteal nerve passes from the great ischiatic foramen with the corresponding vessels where it curves cranioventrally between the deep and middle gluteal muscles then pierces through the cranial portion of the former muscle giving it 2-3 muscular twigs. It ends in the *M. tensor fascia lata* by dividing into 2-3 branches which ramify in this muscle. The nerve at its emergence gives off two muscular twigs to the *M. gluteus medius*.

N. Gluteus caudalis:

The caudal gluteal nerve (2/3, 4/12) arises from the dorsal aspect of the lumbosacral trunk. Its fibers are derived mainly from the ventral branches of the last lumbar and first sacral nerves. It emerges from the pelvic cavity through the great ischiatic foramen and passes caudally for 1.5-2 cm on the dorsolateral aspect of the sciatic nerve, then continues between the *M. piriformis* and *M. gluteus superficialis* to end by two branches in the latter muscle at

its middle. The nerve detaches a muscular branch to the *M. piriformis* after its emergence.

N. *Cutaneus femoris caudalis*:

The caudal cutaneous femoral nerve (4/13) arises from the 1st and 2nd sacral nerves and passes dorsal to the ischiatic nerve through the great ischiatic notch, then continues caudally under the caudal part of the *M. piriformis*. It connects with the ischiatic nerve and continues undercover the *M. gluteus superficialis*. The nerve then pierces the proximal part of the *M. biceps femoris* lateral to the tuber ischii, then descends between the latter muscle and the *M. semitendinosus* till the middle of the thigh, supplying cutaneous branches to the skin and fascia of the caudal and lateral aspects of the thigh. As its exit the nerve sends a small branch which crosses the caudal part of the *M. obturatorius internus* and the ischial arch and passes through the ischio-rectal fossa, then divides into 3-4 cutaneous nerves (*Nn. clunii Caudalis*) which innervate the skin around the anus and cutaneous branches to the caudomedial aspect of the thigh.

N. *Ischiadicus*:

The ischiatic nerve (2/2, 3/1, 4/19) represent the continuation of the lumbosacral trunk. It arises from the ventral branches of the last lumbar and first sacral nerves and small roots from the 6th lumbar and second sacral nerves. The root of the last lumbar connect with the trunk after its course for about 0.5 cm caudoventrally from the intervertebral foramen. The first sacral passes caudally in the vertebral canal for about 2-2.5 cm and continues caudoventrally from the intervetebral foramen for about 0.5-1 cm to connect with the lumbosacral trunk. The second sacral root courses 2.5-3.0 cm intravertebral and 1 cm extravertebral till it connects the trunk. The ischiatic nerve emerges from the pelvic cavity through the great ischiatic foramen and passes caudally between the *Mm. gluteus medius* and *piriformis*. The nerve continues as combined tibial and fibular parts in a common fibrous sheath over the *gemelli* and tendon of *M. obturatorius internus*, then curves distally over the *Mm. quadratus femoris*, *adductor* and *semimembranoses* being undercover the *Mm. biceps femoris* and *abductor cruris caudalis*. Near the middle of the thigh the tibial and fibular nerves apparently separate. Along its course, the ischiatic nerve gives of small and large rami musculares as the following:

1- Small Rr. musculares:

They are 2-3 branches arising from the caudomedial aspect of the ischiatic nerve after its emergence by 0.5 cm. The first one passes caudally with the main trunk to end in the cranial part of *Mm. gemelli*. The second one passes caudomedially to end in the caudal part of the *M. obturatorius internus* through the lesser ischiatic foramen. The third one if presents, courses caudally between the nerve and the cranial part of the *Mm. gemelli*, then continues under the tendon of the *M. obturatorius externus* and the substance of the caudal part of the *Mm. gemelli* to end in the *M. quadratus femoris* innervating it.

2- Large Rr. musculares:

There are two large muscular branches (4/20) arising from the ischiatic nerve after its emergence by 1.5 cm and are separated from it at the level of the greater trochanter of the femur. The first one courses caudally for 1.0-1.5 cm to enter the proximal part of the *Mm. biceps femoris* and abductor cruris caudalis. The second one courses more distally about 2 cm and divides into two branches one of them redivides into two branches which terminate at the middle of the biceps femoris and semitendinosus muscles. The other branch passes distally over the *M. adductor* to end in the *M. semimembranosus*.

N. Peroneus communis:

The common peroneal nerve (3/4, 4/26) arises from the *N. ischiadicus* after its emergence from the greater ischiatic foramen by 1.5-2.0 cm. It takes the previously mentioned course of the ischiatic nerve cranial to the tibial nerve. At the middle of the thigh it separates from the latter nerve. It passes distally over the *M. semimembranosus* then crosses the lateral aspect of the proximal part of the lateral head of the *M. gastrocnemius* being covered by the *M. biceps femoris*. After that the nerve crosses the lateral aspect of the *M. flexor hallucis longus* obliquely to dip between it and the *M. fibularis longus* at a distance of about 1.5-2 cm distal to the stifle joint where it sends a muscular branch to the latter mentioned muscle and divides into superficial and deep peroneal nerves. In the thigh region the common peroneal nerve detaches the *N. cutaneus surae lateralis*.

N. Cutaneus surae lateralis:

The lateral cutaneous sural nerve (4/27) arises from the caudal aspect of the common peroneal nerve at the middle of the thigh. It courses distally for about 1.5 cm, then pierces through the *M. biceps femoris* and emerges subcutaneously 2 cm proximal to the femoral trochlea and 1.5 cm cranial to the caudal end of the thigh. It continues distally in the proximal

part of the leg. It distributes in the skin of the proximal half of the leg. In two dissected specimens the *N. cutaneus surae lateralis* arose with the large muscular branch of the ischiatic nerve passing distally with it. The nerve then pierces the *M. biceps femoris* to continue its course as the previously mentioned.

N. Peroneus superficialis

The superficial peroneal nerve (4/29, 5/1) courses distally between the *M. extensor digitorum lateralis* and the *M. fibularis longus*. In the middle third of the leg it is accompanied with the superficial branch of the *A. tibialis cranialis*. Then the nerve passes under the tendon of the latter muscle over the *M. fibularis brevis*. After that the nerve continues dorsal to the tarsus being lateral to the long digital extensor tendon. Just proximal to the tarsocrural articulation, it gives off medial and lateral branches. The medial branch connects with the twigs from *R. cranialis* of *N. saphenus* and continues on the dorsomedial aspect of metatarsus II till the dorsal abaxial aspect of the second phalanx as *N. digitalis dorsalis II abaxialis*. The lateral one (5/2) continues distally along the dorsolateral aspect of metatarsus V to end on the abaxial surface of the lateral digit as *N. digitalis V abaxialis* (5/6). The superficial peroneal nerve then descends on the middorsal aspect of the proximal third of metatarsus where it divides into medial and lateral branches. The medial one continues distally on the medial intermetatarsal space as *N. digitalis dorsalis communis II* (5/5). The lateral branch (5/11) descends till the middle of metatarsus to divide into *Nn. digitalis dorsalis communis III, IV* (5/12, 5/13). Each dorsal common digital nerve continues in its corresponding intermetatarsal spaces. Near the metatarsophalangeal articulation, they connect with the corresponding dorsal metatarsal nerves and divides into axial and abaxial dorsal proper digital nerves.

N. Peroneus profundus:

The deep peroneal nerve (4/28, 5/9) is the smaller terminal branch of the *N. peroneus communis*. It passes distally with the *A. tibialis cranialis* on the cranial aspect of the tibia between the *M. tibialis cranialis* and the *M. extensor digitorum longus* till it reaches the tarsocrural articulation. In the first 2 cm of its course the deep peroneal nerve gives off 3-4 muscular branches which innervate the *Mm. extensor longus, tibialis cranialis, fibularis longus, extensor digitorum lateralis, extensor digitorum I longus* and *fibularis brevis*. At

the flexor aspects of the tarsus the deep fibular nerve divides into medial and lateral branches. The medial one descends on the second inter metatarsal space as the *N. metatarsus dorsalis* II (5/10). The lateral branch courses under the *M. extensor digitorum brevis* supplying it and divides into *Nn. metarsae dorsalis* III and IV (5/12, 5/13). The dorsal metatarsal nerves connect with the corresponding dorsal common digital nerves at the distal part of metatarsus.

N. Tibialis:

The tibial nerve (3/3, 4/21, 6/1) apparently separates from the common peroneal nerve at the middle of the thigh. The tibial nerve descends between the *M. semimembranosus* medially and *M. biceps femoris* laterally then enters between the two heads of the *M. gastrocnemius* to continue between the medial head of the latter muscle and the superficial digital flexor muscle caudally and the *M. flexor digitorum longus* cranially. In the distal third of the leg the nerve descends in the crural fascia between the calcaneal tendon and the deep digital flexor muscle. proximal to the level of the tarsocrural joint, it divides into lateral and medial planter nerves. Along its course the tibial nerve gives off *N. cutaneus surae* caudales, *Rr. musculares* and *Rr. cutanei* to the caudomedial aspect the leg.

N. cutaneus surae caudalis:

The nerve (3/5) arises from the *N. tibialis* near the middle of the thigh region and courses distally with the parent nerve, then descends on the caudal aspect of the *M. gastrocnemius*. In the middle of the leg it divides into cranial and caudal branches. The cranial one descends along the lateral aspect of tendinous part of the lateral head of the *M. gastrocnemius* to join the tibial nerve 2 cm proximal to the tarsocrural articulation. The caudal branch continues distally accompanied with the caudal branch of the saphenous vein then divides in the distal third of the leg into 3-4 rami cutanei ramified in the skin of the lateral and caudolateral aspect of the distal third of the leg, tarsus and metatarsus. One of these branches is connected with the superficial peroneal nerve 1.5 cm proximal to the tarsocrural articulation

Rr. musculares:

The tibial nerve gives of of A 3-5 muscular branches (4/23) to the caudal muscles of the leg in the following manner: -

- A muscular branch arising with the *N. cutaneus surae caudalis* passes distally with it, then enters in the medial head of *M. gastrocnemius*

- Another muscular branch arises from the caudal aspect of the nerve 2 cm before its entrance between the two heads of *M. gastrocnemius*. It descends for about 2 cm then divides into 2-3 small branches distributing in the *Mm. flexor digitorum superficialis* and two heads of *gastrocnemius*.
- A large muscular branch is detached from the tibial nerve at its entrance between the two heads of *M. gastrocnemius*. It courses distally for 1-2 cm between the medial head of *M. gastrocnemius* and *M. flexor digitorum superficialis* to divide into 2-3 branches. One of these branches enters the *M. popliteus* and the others descend for about 1-2 cm then ramify in the *M. flexor digitorum longus*, *flexor digitorum I long* and *tibialis caudalis*.
- As the tibial nerve separates from the common peroneal nerve it sends a small branch which passes distally to end in the popliteal lymph node.

N. Plantaris medialis:

The medial plantar nerve (4/24, 6/2) descends on the medio-plantar aspect of the tarsal joint medial to the flexor tendons accompanied with the lateral plantar nerve. After that the nerve continues distally along the medial border of the superficial flexor tendon till the junction of the distal two thirds of metatarsus, it divides into *Nn. digitales plantares communis* II, III and IV (6/4, 6/5, 6/6). At the end of the proximal third of metatarsus it gives off the *N. digitalis plantaris II abaxialis* (6/3) to the abaxial aspect of the second digit. The common plantar digital nerves descend in respective intermetatarsal spaces. At the level of metatarsophalangeal articulation they are connected with the corresponding plantar metatarsal nerves and dividing into proper digital nerves to both axial and abaxial aspects of the digits.

N. Plantaris lateralis:

The lateral plantar nerve (4/25, 6/7) is the largest terminal branch of the tibial nerve. It continues distally and laterally between the superficial and deep digital flexor tendons. At the proximal third of the metatarsus it gives off the *R. profundus* (6/8) to the muscles of the hind paw (*interflexorii*, *interossei*, *lumbricales* and *flexor digitorum brevis*). The nerve after that gives off small lateral branch *N. digitalis plantaris V abaxialis* (6/18) and near the middle of metatarsus it divides into *Nn. metatarsi plantares* II, III, IV (6/9, 6/10, 6/11).

DISCUSSION

In the fox, the nerves of the plevic limbs are formed from the ventral branches of the last four lumbar and first two sacral nerves and the lumbar enlargement of the spinal cord was present from the level of the 4th to 6th lumbar vertebra. while in the dog these nerves originated from the last five lumbar and first three sacral nerves and the enlargement of the spinal cord was recorded at the level from 3rd to 5th lumbar vertebra (SKERRITT and McLELLAND, 1984). The *N. cutaneus femorislateralis* in the fox arises from the 4th lumbar nerve, while FLETCHER (1970) in the dog reported the origin of the nerve from the 3rd and 4th lumbar nerve simulating that recorded in one exceptional specimen in the fox. On the other hand, GHOSHAL (1975) in the cat recorded the origin of the nerve from the 4th and 5th lumbar nerves. In the present investigation the *N. cutaneus femoris lateralis* descends along the cranial border of the *M. tensor fascia lata*. while in dog it descends along its craniolateral aspect (SEIFERLE, 1984). The distribution of the nerve in the fox resembles that reported in the dog (ADAMS, 1986). The formation of the femoral nerve in the fox simulates that recorded in the dog by FLETCHER, 1970 and DE. LAHUNTA and HABEL, 1986). On the other hand TAYLOR (1970) in the dog recorded that the femoral nerve arises from the ventral branches of 3rd, 4th and 5th lumbar nerves. In agreement with that recorded by SKERRITT and McLELLAND (1984) in the dog the femoral nerve supplies the *Mm. quadriceps femoris* and *articularis genus*. In contrast to that mentioned by KOCH (1970) and SEIFERLE (1984) in domestic animals, the femoral nerve does not supply the *Mm. pectineus* and *gracilis*. TAYLOR (1970) and ADAMS (1986) in the dog recorded the same areas of innervation of the saphenous nerve as that of the present investigation. Also SEIFERLE (1984) in the dog asserted that the saphenous nerve gives off a small articular branch to the stifle joint. GHOSHAL (1975) in the dog recorded the division of the nerve into two branches and a connection between the terminal branches of the saphenous and superficial peroneal nerves, these results are also described in the present investigation. The obturator nerve in the fox arises from ventral branches of the 4th, 5th and 6th lumbar nerves and is distributed in the *Mm. pectineus*, *adductor*, *gracilis* and *obturatorius externus* simulating that recorded by EVANS and CHRISTENSEN (1979) and SEIFERLE (1984) in the dog. BONINE (1980) and GHOSHAL (1957) in feline reported the origin of the nerve from the ventral branches of 6th and 7th lumbar nerves. The *N. gluteus cranialis* is originated from the ventral

branches of the last two lumbar nerves as that revealed by FLETCHER (1970) in the dog and GHOSHAL (1975) in feline. On the other hand TAYLOR (1970) in the dog reported that the nerve originates from the ventral branches of the last two lumbar and first sacral nerves. However BRADLEY and GRAHAME (1959) in the dog illustrated the origin of the nerve from the first two sacral nerves only. The distribution of the nerve in the fox simulates that recorded in the dog by EVANS and CHRISTENSEN (1979). The innervation of the *M. piriformis* from the cranial gluteal nerve in canine and feline (GHOSHAL, 1975) was not observed in the fox. The caudal gluteal nerve takes its origin from the 7th lumbar and 1st sacral nerves. In the dog it arises from the 7th lumbar (TAYLOR, 1970, and EVANS and CRISTENSEN, 1979) or the 1st sacral nerve only (FLETCHER, 1970). Contrary to that present in fox, the caudal gluteal nerve supplies the *M. gluteus profundus* in the dog (TAYLOR, 1970), *M. gluteus medius* (EVANS and CHIRISTENSEN, 1979), *M. abductor cruris caudalis* in feline (SELFERLE, 1984). The *N. cutaneus femoris caudalis* in the fox arises from the ventral branches of the 1st and 2nd sacral nerves as that reported in the dog by HAVELKA (1928) while BRADLEY and GRAHAME (1959) in the dog recorded that the nerve arises from the last lumbar and first sacral nerves. The saciatic nerve in the fox originates from the ventral branches of the last two lumbar and first two sacral nerves as that recorded in dog and cat by FLETCHER (1970). The nerve divides after short course into tibial and peroneal nerves which course in a common fibrous sheath as that mentioned by ADAMS (1987) in the dog. On the other hand DELAHUNTA (1986) in the dog stated that the fibular and tibial nerves have independent origins. The *N. cutaneus surae lateralis* in the fox originates from the *N. peroneus communis* at the middle of the thigh and supplies the skin of the proximal half of the leg. However EVANS and CHRISTENSEN (1979) in the dog stated that the nerve arises at the junction of the middle and distal thirds of the thigh and supplies the skin of the lateral aspect of leg till the tarsus. In contrary to that reported in the dog by GHOSHAL (1975), the aricular branch to the stifle joint was not observed. The superficial peroneal nerve gives off the dorsal abaxial digital nerves II, and V before its division into lateral and medial branches. While in feline these two nerves arise from the medial and lateral branches respectively (GHOSHAL, 1975). The second dorsal abaxial digital nerve in the dog may arise from the *N. saphenus* (BEER, 1968). that 9 result which is not found in the present

work. In agreement with that mentioned in the feline by TAYLOR and WEBER (1951) and CROUCH (1969) the *N. peroneus profundus* supplies the *M. extensor digitorum bervis*. However, GHOSHAL (1975) reported in the feline that the innervation of muscle is detached from superficial fibular nerve. The *N. peroneus profundus* in the present work is divided at tarsometatarsal articulation into medial and lateral branches simulating that recorded by EVANS and CHRISTIENSEN (1979) in dog. ZIETZSCHMANN, ACKERKNECHT and GRAU (1943) in feline recorded that the deep fibular nerve is divided into dorsal metatarsal nerves a variable levels of metatarsus. The course and distribution of the tibial nerve in the fox is similar to that recorded by ADAMS (1986) in the dog. BENNIT (1976) in the latter animal stated that the *N. tibialis* originates from S1&S2. The *N. cutaneus surae caudalis* arises from the tibial nerve as that recorded in the canine (GHOSHAL 1975) The caudal cutaneous sural nerve in the dog is divided into *R. cranialis* and *R. caudalis* (GHOSHAL, 1975) which in agreement with our results. EVANS and CHRISTENSEN (1979) in the dog stated that, the medial planter nerve is divided at the proximal end of metatarsus into the common planter digital nerves. However in our work this division occurs distally at the junction of the distal two thirds of metatarsus.

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LEGENDS OF FIGURES

Fig. 1,4:

- 1- R. ventralis of 4th lumbar nerve.
- 2- R. ventralis of 5th lumbar nerve.
- 3- R. ventralis of 6th lumbar nerve.
- 4- R. ventralis of 7th lumbar nerve.
- 5- R. ventralis of 1st sacral nerve.
- 6- R. ventralis of 2nd sacral nerve.
- 7- N. cutaneus femoris lateralis.
- 8- N. femoralis.
- 9- N. obturatorius.
- 10- Lumbosacral trunk.
- 11- N. Gluteus cranialis.
- 12- N. Gluteus caudalis.
- 13- N. cutaneus femoris caudalis
- 14- Br. musculares of N. femoralis.
- 15- N. saphenus.
- 16- R. muscularis of M. sartorius.
- 17- R. cranialis of N. saphenus.
- 18- R. caudalis of N. saphenus.
- 19- N. ischiadicus.
- 20- Rr. muscularis of 19.
- 21- N. tibialis.
- 22- N. cutaneus surae caudalis.
- 23- Rr. musculares of 21.
- 24- N. plantaris medialis
- 25- N. plantaris lateralis.
- 26- N. peroneus communis.
- 27- N. cutaneus surae lateralis.
- 28- N. peroneus profundus.
- 29- N. peroneus superficialis.

Fig. 2

- 1- N. gluteus cranialis
- 2- N. ischiadicus.
- 3- N. gluteus caudalis.
- A- M. gluteus profundus.
- B- M. gluteus medius.
- C- M. gluteus superficialis.
- D- M. tensor fascia lata.
- E- M. biceps femoris.

Fig. 3

- 1- N. ischiadicus.
- 2- Rr. musculares.
- 3- N. tibialis.
- 4- N. peroneus communis.
- 5- N. cutaneus surae caudalis.
- 6- Rr. musculares of N. tibialis.
- A- M. Vastus lateralis.
- B- M. adductor.
- C- M. smimembranosus.
- D- M. semitendinosus.
- E- M. abductor cruris caudalis.
- F- M. biceps femoris.

Fig. 5

- 1- N. peroneus superficialis.
- 2- R. lateralis of 1.
- 3- N. digitalis dorsalis communis IV.
- 4- N. digitalis dorsalis communis III.
- 5- N. digitalis dorsalis communis II.
- 6- N. digitalis dorsalis V abaxialis.
- 7- N. digitalis dorsalis II abxialis.
- 8- R. caudalis of N. saphenus.
- 9- N. peroneus profundus.
- 10- N. metatarsus dosalis II.
- 11- R. lateralis of 9.
- 12- N. metatarsus dorsalis III.
- 13- N. metatarsus dorsalis IV.
- 14- N. digitalis dorsalis proprius II axialis.
- 15- N. digitalis dorsalis proprius III abaxialis.
- 16- N. digitalis dorsalis proprius III axialis.
- 17- N. digitalis dorsalis proprius IV axialis.
- 18- N. digitalis dorsalis proprius IV abaxialis.
- 19- N. digitalis dorsalis proprius V axialis.

Fig. 6

- 1- N. tibialis.
- 2- N. planataris medialis.
- 3- N. digitalis plantaris II abaxialis.
- 4- N. digitalis plantaris communis II.
- 5- N. digitalis plantaris communis III.
- 6- N. digitalis planteris communis IV.
- 7- N. plantaris lateralis.

- 8- R. profundus.
- 9- N. metatarsus plantaris II.
- 10-N. metatarsus plantaris III.
- 11-N. metatarsus plantaris IV.
- 12-N. digitalis plantaris proprius II axialis.
- 13-N. digitalis plantaris proprius III abaxialis.
- 14-N. digitalis plantaris proprius III axialis.
- 15-N. digitalis plantaris proprius IV axialis.
- 16-N. digitalis planteris proprius IV abaxialis.
- 17-N. digitalis plantaris proprius V axialis.
- 18-N. digitalis plantaris V abaxialis.
- 19-N. cutaneus surae caudalis.







