The Role of Interventional Radiology in Management of ischaemia of lower limbs

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Thesis submitted for partial fulfillment of M.D. degree in Radio-diagnosis

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CAIRO 1989

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TO SPIRIT OF MY DEAR FATHER

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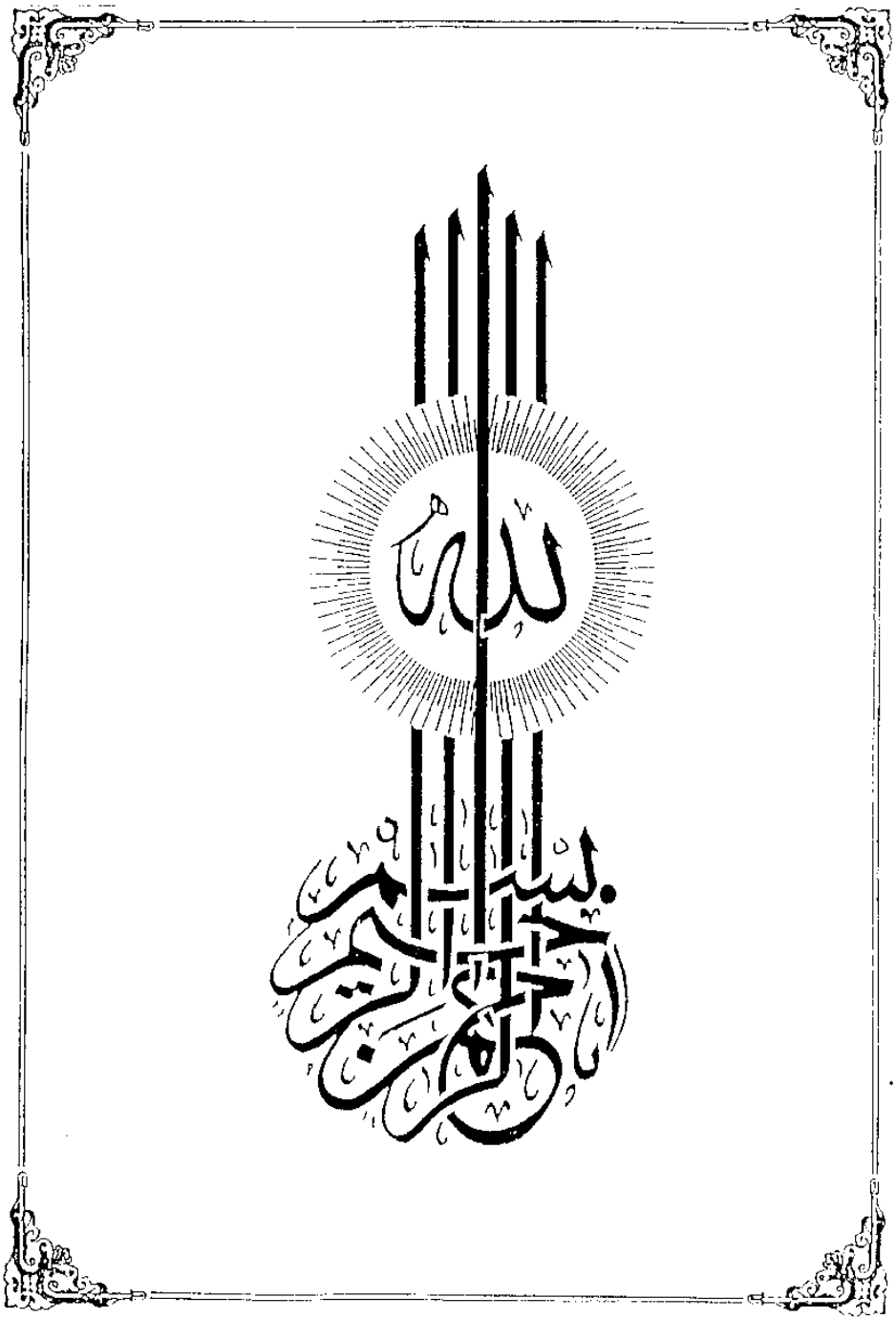

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INTROUDUCTION AND AIM OF THE WORK

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terventional radiology means the use of radiodiagnostic techniques to
ıieve therapeutic purposes.

rcutaneous transluminal angioplasty was first tried to dilate
stenotic arterial segment by dotter and judkins at 1964.
aplel968,Gruntzig 1974 and van Andel 1976 added to the primary
chnique tried by Dotter.

1972 Dotter et al described low dose local infusion of streptokinase
or the management of acute arterial occlusive disorders.

found that the complications of this method are fewer in comparison
o systemic use of streptokinase due to lower dose and local application.

this work ,both angioplasty and intra arterial thrombolysis by
reptiokinase will be performed in twenty patients, .

n patients are subjected to either of the two techniques.

will study the role of both techniques in the management of lower
mb ischaemia.

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ANATOMY

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Anatomy of the blood vessels of the lower limb

Abdominal Aorta:

Starts at midline at aortic hiatus of diaphragm infront of lower border of D12 anterior to spine ending at level of L4 slightly to left giving two common iliac arteries (4-5cm long) and each of them divide opposite L5-S1 level into two branches, the external and internal iliac arteries, the external supplied the lower limb and the internal iliac supplied the viscera, walls of the pelvis, perineum and gluteal region and that artery arises at level of lumbosacral junction infront of sacro-iliac joint and divides at greater sciatic foramen into anterior and posterior trunks. (Fig.1)

The external iliac arteries run obliquely down and laterally along medial border of psoas major from bifurcation of common iliac artery to a mid point between anterior superior iliac spine and symphysis pubis passing to thigh behind inguinal ligament giving the femoral artery which passes down front and medial side of thigh and it ends at the junction

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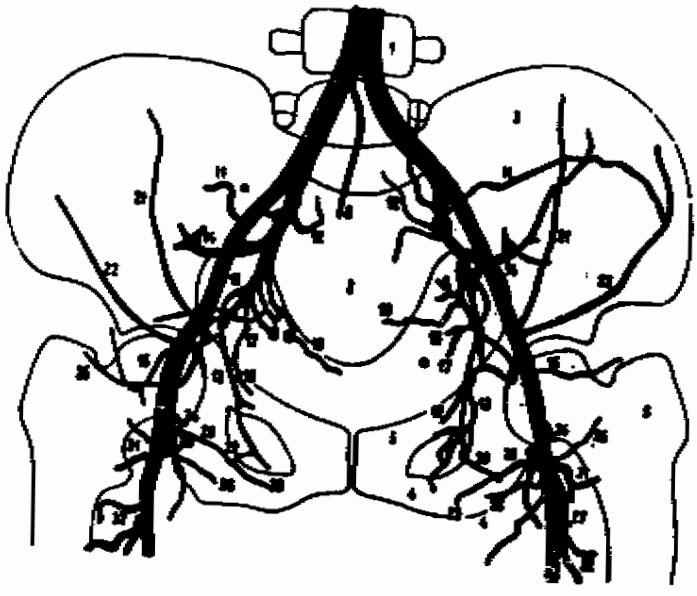

1. 4th lumbar vertebra
2. Sacrum
3. Ilium
4. Ischium
5. Pubic bone
6. Femur
7. Abdominal aorta
8. Median sacral artery
9. Common iliac artery
10. Internal iliac artery
11. Iliolumbar artery
12. Lateral sacral arteries
13. Obturator artery
14. Superior gluteal artery
15. Inferior gluteal artery
16. Superior vesical artery
17. Inferior vesical and middle rectal arteries
18. Uterine artery
19. Internal pudendal artery
20. External iliac artery
21. Inferior epigastric artery
22. Deep circumflex iliac artery
23. Femoral artery
24. Superficial epigastric artery
25. Superficial circumflex iliac artery
26. External pudendal artery
27. Deep femoral artery
28. Medial circumflex femoral artery
29. Ascending branch
30. Deep branch
31. Ascending branch of lateral circumflex femoral artery
32. Descending branch

After Luzsa (1974)

Figure (1)

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of middle and lower thirds of the thigh passing through the opening in the adductor magnus to become the popliteal artery.

- The femoral artery gives the deep femoral artery (profunda femoris). which arises from its lateral side 3.5cm below the inguinal ligament and it is considered the main supply to adductor, extensor and flexor muscles and forms a number of anastomoses with external , internal iliac and popliteal arteries(Fig.2)

- If the femoral artery was occluded above the level of the profunda femoris artery the following anastomosis are immediately ready to overcome the possible resultant ischaemia:-

(1) Superior and inferior gluteal arteries of internal iliac artery anasotmose with medial and lateral circumflex femoral and first perforating artery of profunda femoris (deep femoral) artery.

(2) The obturator artery of internal iliac with medial circumflex femoral of deep femoral artery.

(3) The internal pudendal branch of the internal iliac with superficial and deep external pundendal of femoral artery.

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1. Ischium
2. Femur
3. Tibia
4. Patella
5. Obturator artery
6. Inferior gluteal artery
7. Anastomosis between obturator and deep femoral arteries
8. Pubic branch
9. Femoral artery
10. Superficial epigastric artery
11. Superficial circumflex iliac artery
12. External pudendal artery
13. Anterior labial branches
14. Inguinal branches
15. Deep femoral artery
16. Medial circumflex femoral artery
17. Ascending branch
18. Lateral circumflex femoral artery
19. Ascending branch
20. Descending branch
21. Perforating arteries
22. Descending genicular artery
23. Saphenous branch
24. Articular branches
25. Popliteal artery
26. Superior genicular arteries
27. Sural arteries

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Figure (2)

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(4) Deep circumflex iliac branch of external iliac artery with lateral circumflex femoral of deep femoral and superficial circumflex iliac of the femoral artery.
(5) The inferior gluteal of the internal iliac with the perforators of the deep femoral.

- The popliteal artery starts as a continuation of the femoral artery at the opening in the adductor magnus at junction of middle and lower thirds of the thigh, then it extends down wards and laterally to inter condylar fossa of femur, then passes obliquely to lower border of popliteus muscle dividing into anterior and posterior tibial arteries.

The popliteal artery in addition to its two terminal branches gives cutaneous, muscular and genicular branches. (fig.3)

- The anterior tibial artery is a terminal branch of the popliteal passing forwards in front of the leg medial to fibular neck in front of interosseous membrane, and becomes anterior to tibia in the lower leg, and in front of the ankle it is midway between the malleoli continuing on the tibial side of dorsum of foot as dorsalis pedis artery.

- while the posterior tibial artery starts at lower border of popliteus between tibia and fibula passing downwards and medially on back of the leg then it

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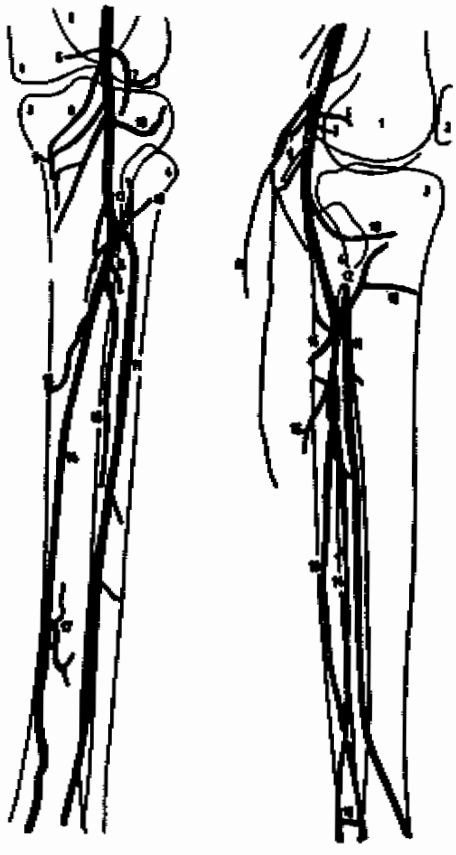

1. Femur
2. Patella
3. Tibia
4. Fibula
5. Poplitcal artery
6. Medial superior genicular artery
7. Lateral superior genicular artery
8. Sural arteries
9. Medial inferior genicular artery
10. Lateral inferior genicular artery
11. Anterior tibial artery
12. Posterior tibial recurrent artery
13. Anterior tibial recurrent artery
14. Posterior tibial artery
15. Circumflex fibular branch
16. Muscular branch
17. Nutrient fibular artery
18. Peroneal artery
19. Communicating branch

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Figure (3)

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divides into medial and lateral planter arteries below the origin of abductor ballucis.

- The peroneal artery arises of posterior tibial 2.5cm below lower border of popliteus, passing obliquely towards the fibula.

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