

LYMPHANGIOGRAPHY

Thesis

SUBMITTED IN PARTIAL FULFILMENT

FOR THE DEGREE OF (M.Sc.)

UROLOGY

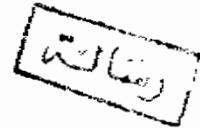
Mohamed
By

Mahmoud M. Abd Alla Ahmed
M.B., B.Ch.

SUPERVISED BY :

Prof. Dr. M. Hatem El-Bialy
Prof. of Urology
FACULTY OF MEDICINE
AIN SHAMS UNIVERSITY

616.60757
M. M



20/5/85

1985

TO MY SON MOHAMED



CONTENTS

	Page
ACKNOWLEDGMENT	1
HISTORICAL REVIEW	2
INTRODUCTION	5
RADIOLOGICAL ANATOMY	7
A. The lymphatic vessels	7
B. The lymph nodes	9
C. Cisterna chyli and thoracic duct	14
TECHNIQUE OF LYMPHANGIOGRAPHY	16
LYMPHANGIOGRAPHY IN THE NORMAL STATE	20
INTERPRETATION OF LYMPHANGIOGRAPHIC FINDINGS	22
A. Abnormal lymphatic vessels	22
B. Abnormal lymph nodes	23
LYMPHANGIOGRAPHY IN CANCER TESTIS	28
LYMPHANGIOGRAPHY IN CANCER PENIS	33
LYMPHANGIOGRAPHY IN CANCER BLADDER	35
LYMPHANGIOGRAPHY IN CANCER PROSTATE	38
LYMPHANGIOGRAPHY IN MISCELLANEOUS CASES	43
COMPLICATIONS OF LYMPHANGIOGRAPHY & THEIR TREATMENT	51
SUMMARY	56
REFERENCES	59
ARABIC SUMMARY	

ACKNOWLEDGMENT

ACKNOWLEDGEMENT

Thanks to **GOD** , the most helpful merciful beneficent.

I am deeply honoured to have the opportunity to express my great indebtedness and gratitude to Professor **Dr. M. HATEM EL-BIALY**, Professor of urology, Faculty of Medicine, Ain shams University for his great help, meticulous supervision, and enthusiastic advice.

I am also thankful and grateful to all staff members of Urology Department , Ain shams University .

HISTORICAL REVIEW

HISTORICAL REVIEW

1. The Lymphatic system:

Although the Greeks as early as 300 BC and subsequently the Alexandrian school, were aware of the existence of the lymphatic system it was not until Gaspar Aselli discovered the mesenteric lacteals of a well fed dog in 1627 and Ludwig collected lymph from various parts of the body that systematic examination of lymph and the lymphatic system in man and animals began.

Ludwig was the first to state that lymph was a filtrate of the blood. This hypothesis was conclusively proved by Starling after many years of bitter controversy.

Following on this, Pecquet (1651) described the cisterna chyli and thoracic duct in a dog and subsequently chyle vessels in man.- These observations awoke a new interest in mapping out the anatomy and investigating the functional physiology of the colourless thin-walled lymphatics and the well-defined group of nodes. The efforts of Thomas Bartholinus (who coined the term "vasa lymphatica" for the lymphatic vessels) and Olaf Rudbeck, the brilliant swede who first demonstrated the existence of valves in the system and the joining of the thoracic duct with the great veins in the mediastinum, shines as outstanding contribution to our present knowledge of the lymphatic system.

Rudbeck also postulated that blockage of the lymphatics produces ascites and oedema.

In 1692 Nuck employed the technique of intralymphatic injection of mercury to outline the lymphatic system.

Mascagni (1784), and Gerota (1896) devised modifications of this technique which enabled Barthels (1909) and Jossifow (1904-30) to conduct comprehensive topographical studies of the human lymphatic system.

The first experiment in visual lymphography was reported by Braithwaite (1923), he injected the dye indigocarmine into the paracaecal region to investigate the lymph flow in living cats. Hudack and Mc Master (1933), investigated the minute lymphatics of human skin after intra-dermal injection of a diffusible dye (patent blue) dissolved in small quantity of fluid

2. Lymphography:

With the discovery of x-rays in 1895, research workers had attempted to utilize it to obtain further knowledge of the anatomy and physiology of the lymphatic system.

In 1931 Carvalho and Pereira injected thorotrast intranodally in order to visualize the efferent lymph vessels on X-rays. Pfahler (1932) injected lipiodol into the maxillary sinuses and demonstrated

the distribution of the lymph drainage which had extended upwards and downwards. Of the various radiopaque media used in human work, thorotrast briefly dominated the stage because it is selectively absorbed by the subcutaneous lymphatics. However, with the realization of its radioactive and carcinogenic properties and its slow excretion from the body its use is declined in human work and the radiologic examination of the lymphatic system diminished, until 1952 when Kinmonth used larger quantities of patent blue dye than were first employed to delineate the lymph trunks and nodes.

by 1954, Kinmonth et al had perfected the technique of direct visual pedal lymphography.

INTRODUCTION

Lymphangiography is the roentgenographic examination of . The lymphatic Vessels made radiopaque by injection of contrast materials.

Lymphography includes:

1. Lymphangiography; which is the roentgenographic study of the lymphatic vessels.
2. Lymphadenography which is the roentgenographic study of the lymph nodes.

In the current method for doing lymphography, contrast medium is injected directly into a peripheral lymphatic vessel. contrast material can be injected directly into subcutaneous tissues (indirect lymphangiography) to opacify adjacent Lymph vessels, or directly into lymph Nodes, but visualization is not nearly as complete or as satisfactory as that resulting from injection directly into a peripheral Lymphatic vessel.

Lymphography is a relatively recent technique firstly introduced by kinmonth (1954), since then many studies were done to evaluate its accuracy as a diagnostic procedure .

Lymphography is used in a variety of conditions in which the lymphatic system is involved either primarily or secondary to extra-

lymphatic neoplasms.

It is the aim of this work to review the technique and to assess its usefulness and accuracy as a diagnostic tool.

RADIOLOGICAL ANATOMY

RADIOLOGICAL ANATOMY

The radiological anatomy of the lymph vessels and lymph nodes of the lower limb, pelvis and abdomen is based on the description of Gergly (1958) Jacobson (1959), Jacobi (1975) Harrison (1977).

A. The lymphatic vessels:

When the contrast medium is injected into one of the lymphatics on the medial part of the dorsum of the foot, the medial lymphatics of the anterior group of the superficial system will be opacified they are about 5 in number and run straight towards the medial aspect of the knee joint.

When contrast medium is injected in one of the lymphatics on the lateral part of the dorsum of the foot, the lateral lymphatics of the anterior group of superficial system will be opacified, they are about 5 in number and they cross over to the medial side of the leg as they ascend from the fibular side of the foot and converge with the medial group at the level of the knee joint and ascend along the medial side of the thigh to the inferior group of the superficial inguinal nodes.

When the contrast medium is injected into one of the lymphatics behind the lateral malleolus, the posterior group of superficial lymphatics will be opacified, which are about 1-3 in number, they run along the short saphenous vein to the popliteal fossa, where efferent lymphatics accompany the femoral artery as deep lymphatics

to the deep inguinal nodes. In ordinary lymphangiography, the deep lymphatics of the leg are not opacified, but by injection of contrast medium in the lymphatics behind the lateral malleolus, the deep lymphatics of the thigh are opacified (Jacobson and Johanson, 1958).

THE LYMPHATIC VESSELS OF THE PELVIS AND ABDOMEN

1. External iliac lymphatics:

The lymph flow from the inguinal nodes divides into three channels and form the external iliac chain.

The outer is made of three straight lymphatics, the middle has less channels and communicates with the inner and outer channels. The inner one has numerous lymphatics. (Fig. 1).

2. Internal iliac lymphatics:

they are not constantly opacified in lymphangiography, noted only in about half of the cases (Kaffas, 1970).

They lie at the level of junction of external and common iliac nodes and afferent lymphatics are demonstrated between them and the internal iliac group. They lie medial to the external iliac channels in the oblique view but have smaller calibre.