INTRODUCTION TO THE LYMPHATIC SYSTEM

The lymphatic system is a collection of vessels, nodes, and organs including the pharyngeal lymphoid ring. Lymph, the fluid flowing through the system, is colorless (L., *lympha* = clear water) and the vessels normally containing it are usually collapsed and difficult to isolate. Hence, the lymphatic system is frequently perceived as being less important than other systems of the body and, in general, given short shrift in textbooks of topographic anatomy. Actually, of course, the lymphatic system is a vital cog in the homeostatic machinery of the body. One of its functions is to return to the bloodvascular system fluids and plasma proteins that were filtered or forced out at the arterial end of capillaries and lost to tissue spaces. By returning extravasated plasma proteins, especially albumins, to the blood stream, the lymphatic system helps maintain plasma osmotic pressure and, thus, the fluid balance between blood and the interstitial spaces.

The lymphatic system has additional important functions in line with its duties as part of the body’s defense establishment. It is responsible for the proliferation and dissemination of lymphocytes, assumes a role in the regulation of the immune response, and participates in the removal of foreign particulate matter. We have already discussed the significance of lymph nodes as filters that trap and neutralize potentially harmful material.

General Plan

Lymph vessels are found almost everywhere in the body, and they come in all sizes. The lymphatic system lacks a muscular pump or heart, and lymph is moved through the system of tubes by the milking and massaging action of pulsating arteries with which lymphatics travel, and of contracting muscles with which they are in contact.

Lymphatic capillaries permeate subepithelial tissues. They are especially abundant at mucocutaneous junctions; *i.e.*, eyelids, external nares, lips, anus, and vagina, and absent from avascular tissue (*e.g.*, epidermis and cartilage) and avascular organs (*e.g.*, cornea and lens of the eye). They appear to be lacking in the alveoli of the lung, in bone marrow, the spleen, the placenta, and in the central nervous system where tissue fluid flows in perivascular sheaths.
In the skin, lymphatic capillaries form a superficial network of closed loops which communicates with a deep capillary plexus. The lymphatics of the deep plexus increase in size and become collecting vessels which conduct lymph towards lymph nodes. They also acquire one-way valves that, when closely spaced, confer on distended vessels a beaded appearance. Efferent lymphatics from groups of nodes form trunks of increasing sizes; those draining the right and left nodes of the abdominopelvic region form the right and left lumbar trunks whose confluence, just below the aortic hiatus, marks the beginning of the thoracic duct (Fig. 17.1). An unpaired intestinal trunk, carrying most of the absorbed fats from the intestine in the form of chylomicrons, may form a third limb—in which case the root of the thoracic duct is expanded and termed the Cisterna chyli. The paired (descending) intercostal trunks, draining the lower intercostal spaces, terminate in the thoracic duct as well.

As you are well aware, the thoracic duct pours its contents into the cardiovascular system where left jugular and subclavian veins meet. Left subclavian, jugular, and bronchomediastinal lymph trunks usually join the thoracic duct before it ends. Lymph from the right hemi-thorax, the right upper limb, and the right side of head and neck is brought to the right jugulosubclavian angle; the right subclavian, jugular, and bronchomediastinal trunks frequently unite to form a right lymphatic duct.

Lymph nodes are inserted into the system at strategic points, and most of the lymph passes through at least one group of nodes, and generally more. Once lymph has entered collecting vessels possessing valves its subsequent course is fixed. Up to that point, however, lymph seeks the path of least resistance—which accounts for variations in textbook descriptions of regional lymphatic drainage.

Lymph nodes are numerous in the axillary and inguinal regions and throughout the head and neck. When abnormally large or swollen, such superficial nodes can be palpated with relative ease. There are, of course, many more deep lymph nodes in the trunk than exist in the limbs.

In general, collecting vessels accompany arteries in their passage through the body, and lymph carried within, therefore, travels a fairly direct and predictable course. All bets are off, however, when obstruction resulting from pathology or disease interferes with normal patterns of lymphatic drainage in the system.

In both upper and lower limbs, superficial lymphatic vessels run alongside superficial veins, e.g., cephalic and saphenous veins, and lymph leaving the superficial nodes of a limb usually flows towards its deep nodes.

Clinical Considerations

Lymph vessels are channels through which bacteria or other pathogens may be carried far afield from the original site of infection. Thus, an abscess at the tip of a finger may develop into an infection of lymphatic vessels of the