Lecture 1

Bsc Hons Part II Paper I A unit I

Aortic Arches (Comparative Anatomy) (1)

In a typical vertebrates embryo, the major arterial channels include a ventral aorta, a dorsal aorta and usually 6 pairs of aortic arches connecting ventral aorta with the dorsal aorta. Blood leaves the heart through ventral aorta which runs forward, ventrally beneath the pharynx and branches anteriorly into a pair of external carotid arteries into head. Ventral aorta gives off, at intervals, 6 pairs of aortic arches running through the visceral arches. Each aortic arch consists of a ventral afferent branchial artery carrying venous blood to capillaries in a gill, and a dorsal efferent branchial artery taking arterial blood from the gill. All the efferent branchial arteries of the same side dorsally join a lateral dorsal aorta or radix which is extended into head as the internal carotid artery. The two lateral dorsal aortae unite just behind the pharynx to form a single median dorsal aorta which continues behind into tail region as caudal artery. Branches from these main arterial channels supply all the parts of vertebrate body.

The arterial systems of adult vertebrates are built according to the same basic plan in vertebrate embryo. The differences are due to increasing complexity of heart on account of a shift from gill respiration to lung respiration. The modifications mainly concerns the progressive reduction of aortic arches from lower to higher vertebrates.

(1) Primitive vertebrates or protochordates - In amphioxus nearly 60 pairs of aortic arches are present connecting the ventral and dorsal aortae.