Arterial Anastomoses of the Upper Extremity

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Scapular Anastomoses (D-1)

The Transverse Cervical artery is a branch from the first part of Subclavian artery. It has a descending branch called the dorsal scapular artery that accompanies the nerve of the same name and runs down the vertebral border of the scapula to its inferior angle.

The Suprascapular artery, which is another branch of the Subclavian, usually the first part (thyrocervical trunk in common with the transverse cervical) crosses over the transverse scapular ligament that bridges the scapular notch. Then it passes through the supraspinous fossa, turns round the lateral border of the spine of the scapula (Spinoglenoid notch) and supplies the infraspinous fossa as far as the inferior angle.

The Subscapular artery branching from the third part of Axillary artery, supplies the subscapularis muscle in the subscapular fossa as far down as the inferior angle. As it runs along the lateral border of the scapula, along the middle of its course, it gives off its Circumflex branch that skirts the lateral border of scapula and enters the infraspinous fossa on the dorsal surface of the bone. The Subscapular artery beyond this point becomes the Thoracodorsal artery and accompanies the nerve of the same name.

All these vessels anastomose, thus communicating the first part of the subclavian artery with the third part of the axillary artery.
Scapular Anastomoses (D-2)

The branches of the Subclavian artery and the Axillary artery that supply the upper limb, though following separate courses, often end up at the same places. As a result, numerous opportunities arise for anastomoses. If one knows the distribution pattern of each relevant vessel, one can deduce regions where distributions overlap and anastomoses are likely to occur.

1. **Acromial anastomosis:**
The arteries reaching the vicinity of the acromion are:
   - Acromial branches of suprascapular artery (1st part of Subclavian)
   - Acromial branches of thoracoacromial artery (2nd part of Axillary)
   - Acromial branches of Circumflex Humeral arteries (3rd part of Axillary)

2. **Supraspinous Anastomosis:**
Within the Supraspinous fossa is an anastomosis between the following arteries that supply the Supraspinatus muscle:
   - Suprascapular artery (1st part of Subclavian)
   - Dorsal Scapular artery (1st or 3rd part of Subclavian)

3. **Infraspinous Anastomosis:**
Within the Infraspinous fossa is an anastomosis between the following arteries that supply the Infraspinatus muscle:
   - Suprascapular artery (1st part of Subclavian)
   - Dorsal Scapular artery (1st or 3rd part of Subclavian)
   - Circumflex Scapular artery (3rd part of Axillary)
   - Thoracodorsal artery (3rd part of Axillary)

4. **Subscapular Anastomosis:**
Within the Subscapular fossa is an anastomosis between the following arteries that supply the Subscapularis muscle:
   - Suprascapular artery (1st part of Subclavian)
   - Dorsal Scapular artery (1st or 3rd part of Subclavian)
   - Subscapular and Thoracodorsal artery (3rd part of Axillary)
**Miscellaneous Anastomoses**
Within the Pectoral muscles, the Lateral thoracic and Thoracoacromial arteries anastomose. Within the Serratus Anterior and tissues of the Axilla, the Dorsal Scapular, Lateral Thoracic, and Thoracodorsal arteries anastomose.

**Significance of all these Anastomoses**
The extent of the anastomotic connections between the branches of the Subclavian and Axillary arteries is so great that a localized occlusion of the Subclavian / Axillary axis anywhere between the Thyrocervical trunk and the Humeral Circumflex arteries does not lead to tissue death in the upper limb. It merely forces blood to circumvent / bypass the occluded site by flowing out through the vessels proximal to the occlusion and then back to the main axis via vessels distal to the occlusion.

**Arterial Anastomoses around the Elbow Joint**
Particular anastomoses between the branches of the Brachial artery and branches of either the Radial or Ulnar arteries around the elbow is of great significance.

The Superior and Inferior Ulnar Collateral branches of the Brachial artery anastomose with the Posterior and Anterior Recurrent branches of the Ulnar artery.

The Anterior and Posterior branches of the Profunda Brachii artery anastomose with the Radial recurrent and Intersosseous recurrent branches of the Radial and Ulnar arteries respectively.

The Posterior branch of the Profunda Brachii anastomoses with the Posterior branch of the Inferior Ulnar collateral artery (a branch of the Brachial artery). This artery is called the middle collateral artery.
Branches of the Ulnar Artery MRCP (I)

1. **Muscular**
2. **Recurrent**
   a. Anterior
   b. Posterior
3. **Carpal**
   a. Palmar
   b. Dorsal
4. **Palmar**
   a. Superficial
   b. Deep
5. **Interosseous**
   a. Anterior
   b. Posterior
   i. Interosseous Recurrent

Branches of the Radial Artery MRCP (RMP)

1. **Muscular**
2. **Recurrent**
3. **Carpal**
   a. Palmar
   b. Dorsal
4. **Palmar**
   a. Superficial
   b. Deep
5. **Arteria Radialis indecis**
6. 1<sup>st</sup> dorsal **Metacarpal artery**
   a. Dorsalis indecis artery
   b. Dorsalis Pollicis artery
7. **Arteria Princeps Pollicis**