The brachial artery is the major artery of the upper limb. It starts in continuation with the axillary artery at the distal border of teres major muscle. The vessels of the upper limb are frequently used for cardiac catheterization and awareness of variations in the branching pattern may prevent any inadvertent injury. To evaluate the prevalence of anatomical variability of brachial artery and enumerate its impact on the clinical implications. We used 50 upper limbs from embalmed human cadavers irrespective of age and sex in our study. The body was placed in supine position with upper limb abducted 90° and the palm facing upwards. The skin incisions were made by the help of Cunningham manual. The length of brachial artery was measured by using an inch tape. The length of the brachial artery measured had a mean 10.13±0.89 inches with a minimum value 8.1 inch and maximum value 13.0 inch. A sound anatomical knowledge of the brachial artery can aid certain procedures such as cardiac catheterization. The brachial artery is derived from the axillary artery. It takes its origin from the inferior border of the tendon of teres major muscle and terminates at the level of the neck of the radius by bifurcating into radial and ulnar arteries. The same fact is observed in the present study. No anomalies were observed in the present study.

ABSTRACT

The brachial artery is the major artery of the upper limb. It starts in continuation with the axillary artery at the distal border of teres major muscle. The vessels of the upper limb are frequently used for cardiac catheterization and awareness of variations in the branching pattern may prevent any inadvertent injury. To evaluate the prevalence of anatomical variability of brachial artery and enumerate its impact on the clinical implications. We used 50 upper limbs from embalmed human cadavers irrespective of age and sex in our study. The body was placed in supine position with upper limb abducted 90° and the palm facing upwards. The skin incisions were made by the help of Cunningham manual. The length of brachial artery was measured by using an inch tape. The length of the brachial artery measured had a mean 10.13±0.89 inches with a minimum value 8.1 inch and maximum value 13.0 inch. A sound anatomical knowledge of the brachial artery can aid certain procedures such as cardiac catheterization. The brachial artery is derived from the axillary artery. It takes its origin from the inferior border of the tendon of teres major muscle and terminates at the level of the neck of the radius by bifurcating into radial and ulnar arteries. The same fact is observed in the present study. No anomalies were observed in the present study.

KEYWORDS: Axillary artery, Brachial artery, Cardiac catheterization, Hemostasis.

INTRODUCTION

The word “Brachial” is derived from the Greek word “Brachion” meaning shorter, brachium also means ‘arm’. The brachial artery is the most important artery of the upper limb. It begins as a continuation of the axillary artery at the distal border of teres major muscle (1). The artery is superficial in its course in the arm and lies in the antero-medial aspect of the arm (2). The branches of the brachial artery are profunda brachii artery, superior and inferior ulnar collateral arteries, nutrient artery to the humerus and muscular branches in the arm (3).

The vessels of the upper limb are repeatedly used for cardiac catheterization and awareness of such variations may prevent any inadvertent injury.

Knowledge of higher division of brachial artery is also important for all cases of traumatic amputation and revascularization techniques. It has to be remembered that the bifurcation of the brachial artery is the most common site for embolism and a higher bifurcation would result in a larger area of ischemia than expected hence, the higher division seeks a greater clinical significance (4).

During forearm flap elevation, the radial artery can be mistaken for superficial vein and ligated causing a vascular disorder in the hand. On the other hand, the presence of a superficial ulnar artery can be advantageous, since it can be used to supply blood to the forearm flap and can be utilized for an easier ulnar-basilic arterio-venous fistula in mid-forearm. The knowledge of existence of these variations helps in fast and easy elevation of forearm flap (5-6).

Attention has to be given to the branching pattern of brachial artery while treating the cases of aneurysms and abscess drainage in the region of axilla, arm and cubital fossa (7).

The brachial and antebrachial arteries are the arteries of choice for making an Arterio-venous fistula involving the radial artery and the cephalic vein in wrist region for dialysis to treat chronic renal failure. They are the first and best choice of the treatment for dialysis because they last longer and need less maintenance (8).

A Sound knowledge of the anatomy of brachial artery is important for orthopaedicians, to achieve hemostasis during operative procedure, as it may also lead to Volkmann’s ischaemic contracture (9).
The skin incisions were made:

iii. In the arm, incision was taken downwards for about 10-12 cm and then transversely across the front of arm to its lateral border.

v. Skin flaps were reflected along the incisions taken, beginning in the median plane.

vii. The length of brachial artery was measured by an inch tape.

The length measured for 50 cadavers had a mean 10.13±0.89 inch with a minimum value 8.1 inch and maximum value 13.0 inch. Thus length lies within the range 13.0 – 8.1 inches. There were 34% cadavers in which the length of brachial artery varied within the range 8.0 – 9.9 inches. Among 60% cadavers the length of brachial artery varies within the range 10.0 – 11.9 inches in 60% cadavers. A range of 12.0 – 13.9 inches was observed in the remaining 6% cadavers.

Ranges between:

<table>
<thead>
<tr>
<th>Length Range</th>
<th>Mean</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.0 - 9.9 inch</td>
<td>9.44</td>
<td>0.51</td>
<td>8.1</td>
<td>9.9</td>
</tr>
<tr>
<td>10.0 - 11.9 inch</td>
<td>10.26</td>
<td>0.48</td>
<td>10.0</td>
<td>11.9</td>
</tr>
<tr>
<td>12.0 - 13.9 inch</td>
<td>12.67</td>
<td>0.58</td>
<td>12.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Total</td>
<td>10.13</td>
<td>0.90</td>
<td>8.1</td>
<td>13.0</td>
</tr>
</tbody>
</table>

Table 1: Distribution of Lengths of Brachial Artery

DISCUSSION

The present study was conducted to establish the length of the brachial artery, taking a measurement from the point of its origin to its termination in its branches. Normally the brachial artery bifurcates at the neck of the radius 2 to 3 cm below the crease of the elbow into two terminal branches namely ulnar and radial arteries. Common interosseous artery arises from ulnar artery. In the study of Bilodi AK and Sanikop MB the difference was found in the terminations of brachial arteries in two limbs of the same body (10). A study conducted by Patnaik, V.V.G et al in the year 2002 estimated the length of brachial artery to be 26.29 cm which divided into its terminal branches 2.99 cm distal to intercondylar line (11). In the year 2010 Namani S et al mentioned a high division of brachial artery at the anteromedial surface of the humeral shaft, between brachialis and medial head of triceps (12). In 2011 Rossi Junior et al conducted a study on 56 cadavers where they found a high division of brachial artery.

MATERIALS AND METHOD

In the present study, upper limbs from embalmed human cadavers were taken. The body was placed in supine position with the palm facing upward and the upper limb was abducted at 90° and the palm facing upwards.

The skin incisions were made:

i. From suprasternal notch to the xiphoid process.

ii. From the tip of xiphoid process, incision was taken upwards and laterally to the nipple encircling the areola around the nipple and continued along the anterior fold of axilla to the arm.

iii. In the arm, incision was taken downwards for about 10-12 cm and then transversely across the front of arm to its lateral border.

iv. Another incision was taken from the upper border of sternum along the clavicle to its acromial end.

v. Skin flaps were reflected along the incisions taken, beginning in the median plane.

vi. Upper incision taken along the groove between the pectoralis major and deltoid.

vii. The length of brachial artery was measured by an inch tape.

OBSERVATIONS & RESULTS

The length measured for 50 cadavers had a mean 10.13±0.89 inch with a minimum value 8.1 inch and maximum value 13.0 inch thus length lies within the range 13.0 – 8.1 inches. There were 34% cadavers in which the length of brachial artery varied within the range 8.0 – 9.9 inches. Among 60% cadavers the length of brachial artery varies within the range 10.0 – 11.9 inches in 60% cadavers. A range of 12.0 – 13.9 inches was observed in the remaining 6% cadavers.
The brachial artery is the major artery of the upper limb. Accurate anatomical knowledge of the vasculature will help surgeons, radiologists and orthopaedicians to avoid mishaps during various procedures such as forearm flap elevation, aneurysms and abscess drainage in the region of axilla, arm and cubital fossa (7). In the present study, maximally in 60% cadavers the length of Brachial artery was found to be within the range 10.0–11.9 inch. Whereas there were 34% cadavers in which the length of brachial artery was found to be within the range 8.0 – 9.9 inch.

REFERENCES

CONCLUSION
The brachial artery is the major artery of the upper limb. An accurate anatomical knowledge of the vasculature will help surgeons, radiologists and orthopaedicians to avoid mishaps during various procedures such as forearm flap elevation, aneurysms and abscess drainage in the region of axilla, arm and cubital fossa. In our study the length of the artery ranged from 8.1 inch to 13.0 inch. No previous study was found which estimates the predictive length of the brachial artery. But some studies estimated the average length of this artery and its variation as well.


licencing Information
Attribution-ShareAlike 2.0 Generic (CC BY-SA 2.0)
Derived from the licencing format of creative commons & creative commonsmay be contacted at https://creativecommons.org/ for further details.