Research Article

A STUDY OF LOHITAKSHA MARMA WITH SPECIAL REFERENCE TO LOWER LIMB

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ABSTRACT

Marma are vital areas of the body on which if any injury occurs may lead to Marana or Maranasadrishya Dukha (Death). As per the description given by Sushruta Samhita, Lohitaksha Marma (vital point in the near to femoral triangle) is situated in between the Urvi Marma (vital point of middle of thigh) and Vankshana Sandhi (hip joint). Both Vagbhata have stated its location at Uroomula (Root of Hip). The injury effects of Lohitaksha Marma (vital point in the near to femoral triangle) leading to Lohita Kshaya (blood loss), Marana (death) and Pakshaghata (paralysis). Therefore the regional and applied Anatomy of Lohitaksha Marma (vital point in the near to femoral triangle) is reviewed in this paper.

Keywords: Lohitaksha Marma (vital point in the near to femoral triangle), femoral artery and vein, hip joint, neck shaft angle of femur, femoral nerve.

INTRODUCTION

Marma science is part of Vedic science. Acharya Charaka has identified 107 Marmas but only Trimarma (Shiras, Hridaya and Basti) are emphasized by him. However Acharya Sushruta described 107 Marma in per view of traumatology. Marma (vital point) is the seat of Prana (life) and is constituted by confluence of Mamsa (muscle), Sira (vein), Snayu (ligament), Asthi (bone) and Sandhi (joint). Injury to these leads to various effects from death to permanent deformity. As per classical description it is Vaikalyakara (leading to deformity) and Sira (vein) Marma (vital point)¹ situated in both the limbs. This Marma is located proximal to Urvi Marma (vital point of middle of thigh) near the root of the Uru (thigh) but distal to the Vankshana Sandhi (hip joint) in case of lower limb.^{2,3} On injury it leads to death due to excess lohita Kshaya (blood loss) and Pakshaghata (paralysis).²

Objectives of the Study

To determine the location, structural composition and traumatic effect of Lohitaksha Marma (vital point in the near to femoral triangle) in relation to lower limb

MATERIALS AND METHODS

Literary works, books, journals including published ones related to the subject was reviewed and related information's were correlated and analyzed scientifically. Observation and identification of surface and regional anatomy on cadaver was done on the basis of dissection. Photography's were collected. The observations then correlated with Ayurvedic and contemporary views. Dissection was carried out in the proximal part of both upper and lower limbs. Three cadavers were considered for the dissection.

Assessment criteria

On the basis of cadaveric dissection the surface and regional anatomy of the Lohitaksha Marma (vital point in the near to femoral triangle) was determined. With the help of literary and observational

study the location and anatomical structure of Lohitaksha Marma (vital point in the near to femoral triangle) was exacted. The applied importance is understood by studying the published articles.

Anatomical Features of the Area around the Lohitaksha Marma of Lower Limb

By considering the classical description it is understood in gross that the Lohitaksha Marma (vital point in the near to femoral triangle) is seen in the femoral triangle in relation to lower limb. The roof of the femoral triangle is formed by the skin, the superficial fascia containing inguinal lymph nodes, the femoral branch of genito femoral nerve, superficial branches of the femoral artery with accompanying veins and the upper part of the great saphenous vein, deep fascia with saphenous opening. Floor of the triangle is formed medially by the adductor longus and pectinus and laterally by the iliacus and psoas major. The contents of the femoral triangle are femoral artery and its branches, femoral vein and its tributaries; femoral sheath encloses the upper 4 cm of the femoral vessels, femoral nerve and its branches, deep inguinal lymph nodes.⁴

Observation

In the lower limb, the dissection was carried out in the anterior aspect of the proximal part of thigh. Deep to the skin the superficial fascia, superficial group of lymph nodes, deep fascia, femoral sheath, femoral nerve, femoral artery and its branches, femoral vein and its tributaries were observed. The hip joint was also dissected and ligaments related to hip joint were observed. (Figure 1-3)

DISCUSSION

The Sira (vein) which nourish the entire body, are seated in Marma, so when they are injured there will be Kshaya of Dhatus (depletion of tissues) due to excessive blood loss, by that Vata getting increased produces severe pain and may lead into death. Vankshana Sandhi (hip joint) is to be correlated to the hip joint. Uru Moola (root of hip) can be understood in terms of either inguinal fold or angle between the neck and shaft of the femur because head of the

femur is involved in the articulation of hip joint. Hip joint is lying 1.2 cm below the inguinal ligament⁵ and just below the joint there is angulation between neck and shaft of femur. On the basis of these features and classical description the location of Marma can be exacted between hip joint and neck - shaft angle of femur. On the basis of dissection it is observed that the profunda femoris is branching at a distance of 3-4.5 cm from mid inguinal point. Superficial and deep branches of femoral artery are found just below the inguinal ligament and above the branching of profunda femoris artery. Many tributaries are draining into femoral vein among which the great saphenous vein is draining from lower limb into the femoral vein in this area only. The division of femoral nerve is also observed close to this area. This Marma (vital point) belongs to Sira (vein) group. On the basis of literature study and practical observation it is revealed that Lohitaksha Marma (vital point in the near to femoral triangle) is mainly composed of femoral artery and its branches, Femoral vein and its tributaries along with the femoral nerve as discussed above. Precisely speaking one cm (half angula) area around the emerging point of profunda femoris artery, branch of femoral is ascertained as seat of this Marma in lower limb. These points have a crucial role in the formation of anastomoses in the surrounding area to maintain the blood supply. If any injury or pathology occurs at these points it implicates the blood supply of a main destiny and area around it. There are four Avedhya Sira (does not punctured vein) namely Jaaladhara (sephanous vein one), Urvi (femoral two) and Lohitaksha present in each limb.⁶ The Lohitaksha Sira (profunda femoris vein) may be seated in the vicinity of this Marma. Injury to these may lead to disability or death. The Lohitaksha Marma (vital point in the near to femoral triangle) has got half Angula dimension. The measurement of one Angula is equal to around 2 cm.⁷ In the classics this dimension to be taken in terms of breadth, depth, length is not certainly told. Therefore the measurement of this Marma is ascertained within half Angula circumference and depth. On the basis of classical description and practical observation it is revealed that part of femoral artery with the emerging point of profunda femoris branch, accompanying veins and femoral nerve are coming within the circumference of half Angula. The injury effect of Lohitaksha Marma (vital point in the near to femoral triangle) is Marana and Pakshaghata (paralysis) or Saktisada (pain in thigh) due to Rakta Kshaya (blood loss). Rakta (blood) is considered as one among the Dasha Pranayatana (ten life receding).⁸ The Rakta (blood) nourishes the succeeding Dhatu (tissue). So loss of Rakta (blood loss) will lead to death. Even though the Lohitaksha Marma (vital point in the near to femoral triangle) is the Vaikalyakara Marma (vital points of deformity), but its Viddha Lakshana (symptoms of injury) giving rise to Marana (death). Vascular injuries of the extremities remain a major cause of limb amputation and death, if not treated early and properly.⁹ severe hemorrhage from any of the major vessels will lead to the hemorrhagic shock. Femoral vessels are among the most commonly injured vascular structures and comprise nearly 70 % of all arterial traumas. Most are the result of penetrating injuries; particularly gunshot wounds.¹⁰ The meaning of the Marana can be understood in the following way:

- Localized ischemia due to the lack of the blood supply can be understood as Marana.

Lower limb arterial Injury carries a high amputation rate. Stab injuries are the least likely to lead to amputations, whereas high velocity firearm injuries are the most likely to do so. The most significant independent risk factor for limb loss is failed revascularization.¹¹

- The Marana may be death of the person.

The severe hemorrhage may cause hypovolemic shock and then later it may lead to death. Sometimes the veins are injured then there is a possibility of the entry of the air into the venous circulation causing air embolism which may lead into death of the person. The thrombus may dislodge from the veins of the limb and it will go to the lungs causing pulmonary embolism. The vessels in femoral region are considerably large in size and pressure in the artery is high as blood flows towards gravity, any stag or gunshot injury will lead to serious or fatal hemorrhage. Major venous hypertension may indicate venous occlusion by hematoma or thrombosis or acute arterio-venous fistula. These are fatal condition when there is involvement of femoral vessels. In a case report of the gunshot injury of the femoral artery, the patient died due to massive hemorrhage. The surgeons who treated the case opined that rapid blood loss can prevent oxygen from reaching the brain and vital organs, leading to death.¹² In the recent study it is observed that the vascular injuries are more among other various injuries and involvement of femoral artery is highest compared to other arteries. The lower extremity artery injuries are more serious and may significantly impact outcome of the trauma patient. If not properly managed may lead to limb loss or death.¹⁰ This study substantiate the Aghata Lakshana (symptoms of injury) of Lohitaksha Marma (vital point in the near to femoral triangle).

- One more opinion related to the Marana is nothing but if the Marma are injured then there will be severe

Pain causing Marana Sadrishya Dukha (severe pain); in case of ischemia there will be severe pain. Even thrombosis also gives raise excruciating pain. The other Viddha Lakshana (symptoms of injury) is Pakshaghata (paralysis). The Pakshaghata (paralysis) can be considered as the paralyzed part. The Pakshaghata (paralysis) may be due to the ischemia, where there is a chance of paralysis of that particular limb, due to hemorrhage. The early symptoms of the limb are ischemia pain, muscle tenderness, sensory and motor loss. Due to acute ischemia there will be pain, pallor, pulse less, parasthesia and paralysis.¹³ Senn N reports in his article 'An experimental and clinical based study on air embolism' a case of death of a soldier who suffered from thigh amputation, from the text "Medical and Surgical History of the British Army in Turkey and the Crimea," Vol. II. The death was due to entry of air through femoral vein.¹⁴ Kauvar DS *et al* mentions 651 isolated infra inguinal arterial injury cases in an article 'National trauma databank analysis of mortality and limb loss in isolated lower extremity vascular trauma'. Cases of death (18) and early limb loss (42) were studied by mechanism. Half of the deaths involved injury to the common femoral artery (CFA), and over 80 % had injury to the CFA or superficial femoral artery (SFA). Death was three times as frequent in the CFA/SFA as in the popliteal/tibial injuries. Penetrating injuries were present in almost 80 % of deaths, and most of these were gunshot wounds. This article also quotes from the article of Bilgen *et al*, who examined autopsies of patients who died from extremity vascular injury. In their report, the femoral artery was injured in 75 % of deaths and the cause of death was exsanguinations in 97 %.¹⁵ Debakey ME *et al* in an article 'Battle injuries of the arteries in World War II' mentions a comparison of the arterial injuries observed in British World War I and American World War II. The injuries are classified on the basis of the artery injured and number of limb loss. In British World War I, among 1202 arterial injury cases, 366 were femoral artery injury and out of which 74 cases had limb loss. In American World War II, among 2741 arterial injury cases 517 cases were of femoral artery injuries out of which 275 cases had limb loss.¹⁶ Thus on the basis of case reports, review study, research articles and surgical observation articles, the post traumatic effect of Lohitaksha Marma (vital point in the near to femoral triangle) is substantiated and it is rationalized.

1.Femoral artery 2.Femoral vein 3.Great saphenous vein 4.Anterior branches of femoral nerve 5.Profunda femoris artery 6.Femoral nerve before division 7.Location of Lohitaksha Marma in lower limb

Figure no I: Neurovascular structures in the femoral triangle

1.Femoral artery 2.Posterior branch of femoral nerve 3.Anterior branch of femoral nerve 4.Lateral circumflex femoral artery

Figure no II: Femoral artery and Femoral nerve

Figure no III: Location of Lohitaksha Marma in the lower limb

CONCLUSION

The Lohitaksha Marma (vital point in the near to femoral triangle) is situated above the Urvi Marma (vital point in the middle of thigh) and below the Vankshana Sandhi (hip joint). The Uru Moola (root of hip) is considered as between the hip joint and neck shaft angle of the femur. The 1 cm circumference on the femoral artery and vein where there is origin of the profunda femoris branch from the artery and entry of great saphenous vein to the femoral vein is the exact location of the Lohitaksha Marma (vital point in the near to femoral triangle). The anatomical structures to be considered under the Lohitaksha Marma (vital point in the near to femoral triangle) in the lower limb are part of the femoral artery where the origin of profunda femoris is seen along with accompanying femoral vein and a part of femoral nerve. The Pakshaghata (paralysis) is considered as pertaining to that particular limb which is injured, caused due to increased blood loss leading into ischemia and paralysis or due to the injury of the surrounding nerves. Marana is considered in three ways i.e., localized death of the tissues due to ischemia or death of a person due to emboli /thrombus dislodged from the site of Marma causing pulmonary embolism and also due to excessive loss of blood causing shock or severe pain causing Marana Sadrishya Dukha (severe pain).

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