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A study of superficial external Pudendal artery and its variations at Saphenofemoral junction

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Abstract

Introduction: Knowledge of anatomical location of Superficial External Pudendal Artery (SEPA), its origin and course is very important while exploring SFJ and ligating its various branches. Surgeon can face dilemma while identifying SEPA, as it lies close to femoral artery and femoral vein. Operating surgeon should know about variations in SEPA, such as its origin, absence and also duplication or rarely even triple pudendal arteries.

Materials and Methods: A prospective non-randomized study of consecutive fifty patients with primary varicose veins who underwent Trendelenburg procedure was carried out. All patients underwent Trendelenburg's operation with stripping of great saphenous vein (GSV).The SEPA was identified by its pulsation. The origin of SEPA, its number and position weather, anterior or posterior to SFJ or medial or lateral to femoral artery were recorded diligently.

Results: In our study of fifty patients, 36 were male and 14 were female. Meticulous search for SEPA by careful dissection was done during all surgical exploration. Origin of SEPA and its relation to SFJ was recorded. We noticed that SEPA was not visualized in two (4%) patients whereas, it was identifiable in rest 48 (96%) patients. We found that SEPA was originating from medial side of femoral artery and it was piercing fascia of thigh and was further passing superio-medially towards the pubis symphysis. Superficial external pudendal artery was crossing anterior to SFJ in 20 (40%) patients whereas it was crossing posterior to SFJ in 28 (56%) patients.

Conclusion: Our study showed that meticulous search and careful dissection can identify superficial external pudendal artery. SEPA was crossing posterior to SFJ in our maximum cases. One must ligate SEPA as soon as encountered while dissection. This will avoid inadvertent injury to SEPA causing torrential bleeding and further increasing post-operative complications.

Keywords: fascia, femoral artery, femoral vein, ligation, saphenous vein, varicose veins

1. Introduction

Varicose veins prevalence ranges between5 % to 30% in adult population [1]. Flush ligation at the sapheno-femoral junction (SFJ) with the femoral vein after ligating all tributaries (Trendelenburg"s procedure) is the most commonly employed open surgical method for treating primary varicose veins with Sapheno-Femoral incompetence.

Knowledge of anatomical location of Superficial External Pudendal Artery (SEPA), its origin and course is very important while exploring SFJ and ligating its various branches. Surgeon can face dilemma while identifying SEPA, as it lies close to femoral artery and femoral vein. Damage to SEPA during dissection or ligation of various venous tributaries of SFJ can lead to significant bleeding [2]. Rare complication such as impotence can also be seen in cases of damaged SEPA [3].

Operating surgeon should know about variations in SEPA, such as its origin, absence and also duplication or rarely even triple pudendal arteries. The present study was undertaken to record the different variations in the number of SEPA as well as its location with respect to SFJ. Precise knowledge about these variations will definitely avoid inadvertent injury to SEPA and further complications.

2. Materials and Methods

A prospective non-randomized study of consecutive fifty patients with primary varicose veins who underwent Trendelenburg procedure was carried out in our hospital between August 2014 and August 2015. Demographic details of all patients were recorded as per protocol.

Diagnosis of varicose veins with incompetent SFJ was established by clinical examination and it was confirmed by venous duplex ultrasound.

Sapheno-femoral junction was marked pre-operatively using duplex ultrasound.

All patients underwent Trendelenburg's operation with stripping of great saphenous vein (GSV). Dissection of the SFJ was carried out using 4 cm oblique incision, with its centre over the SFJ. The incision was carried down through the subcutaneous tissue. Great saphenous vein and SFJ was identified.

The SEPA was identified by its pulsation. The origin of SEPA, its number and position weather, anterior or posterior to SFJ or medial or lateral to femoral artery were recorded diligently.

Descriptive statistics were calculated by measuring mean, standard deviation (SD), and proportions with 95% confidence interval. Inferential statistics were scored by using analysis of

variance, Chi‑square test (to compare independent proportions). *P* < 0.05 was considered as statistically significant. Graphical presentation was done by using Microsoft Excel.

3. Results

In our study of fifty patients, 36 were male and 14 were female. The mean age of patients was 44 (range: 18–70 years). Among fifty patients, 66% patients were <50 years of age and remaining 34% were more than 50 years of age (mean = 44, SD = 15.1)

Meticulous search for SEPA by careful dissection was done during all surgical exploration. Origin of SEPA and its relation to SFJ was recorded.

We noticed that SEPA was not visualized in two (4%) patients whereas, it was identifiable in rest 48 (96%) patients.

We found that SEPA was originating from medial side of femoral artery and it was piercing fascia of thigh and was further passing superio-medially towards the pubis symphysis. We did not encounter any anomaly in the number of SEPA. Superficial external pudendal artery was crossing anterior to SFJ in 20 (40%) patients [Figure: 1] whereas it was crossing posterior to SFJ in 28 (56%) patients.[Figure: 2] [Table 1] P was < 0.05, which was statistically significant.

Table 1: Superficial external Pudendal Artery (EPA) relation with Sapheno-femoral junction (SFJ)

EPA	No of cases	Percentage (n=50)
Anterior to SFJ	20	40
Posterior to SFJ	28	56
Not identified	2	4

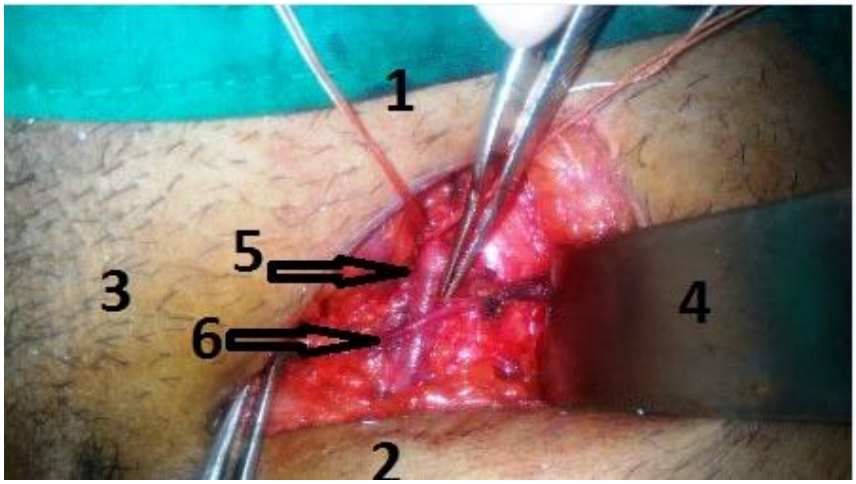

Fig 1: 1:Cranial side, 2:Caudal side, 3:Medial side, 4:Lateral side, 5:Great saphenous vein, 6:Superficial external pudendal artery passing anterior to GSV.

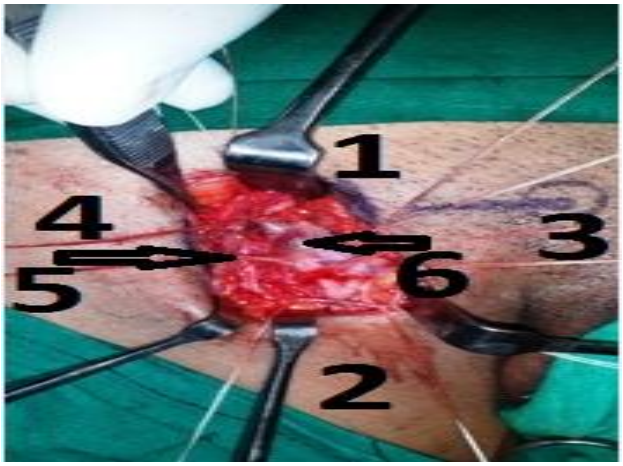

Fig 2: 1:Cranial side, 2:Caudal side, 3:Medial side, 4:Lateral side, 5:Superficial external pudendal artery passing posterior to GSV, 6:Great saphenous vein with its tributaries

4. Discussion

A complete knowledge about anatomy of SEPA and its variations is important while dealing with SFJ dissection during Trendelenburg's operation. This will ensure that the junction is safely managed in least aggressive and most effective way.

Superficial external pudendal artery is a collateral branch of the common femoral artery [4]. It primarily supply blood to the penis or the clitoris. Its relationship with the venous arch of the great saphenous vein and its afferents in femoral triangle, are very narrow.

According to Patil *et al* there is only one study in literature which describes the anatomy of SEPA, however none of the available literature describes origin and course of it [5]. According to them, SEPA always originated from the medial side of femoral artery at the level of SFJ which was consistent

with our study. It was arising from femoral artery in 98% cases and only in 1 case it was originating from deep femoral artery according La Falce *et al* [6].

In a study of 228 patients, Hemmati *et al* observed SEPA in all the cases [2]. La Falce *et a*l and Herniet *et al* however couldn't find SEPA in their all patients [6,3]. Recent study by Souroullas P *et all* showed that SEPA was present in their 150 (87.2%) cases [7]. We found that SEPA was unidentifiable in our 2 patients whereas, in 96% patients it was identifiable.

Duplication of SEPA was seen in 46% of cases in one study where division produced Superior SEPA and an Inferior SEPA [6]. We could not find any other series with such a large number of duplex SEPA in available literature. There was also one study which identified Triple Pudendals, which is rare clinical scenario [3]. In our study, diligent dissection could not detect any such SEPA anomalies.

Hemmati *et al* found, SEPA was crossing SFJ anteriorly in 39.5 % and posteriorly in 60.5% patients [2]. We found similar findings in our study where, SEPA was crossing anterior to SFJ in 40% and posterior in 56% of patients. According to the one recent study SEPA was superficial to the GSV in 36 (20.9%) cases and deep to GSV in 136 (79.1%) [7].

Identification of SEPA and its divison in SFJ exploration is very important, damage to it can lead to significant bleeding. Operating surgeon at a times can get confused with this torrential bleeding and inadvertent application of clamp or cautery can lead to damage to femoral vein or femoral artery increasing further morbidity. Some authorities even recommend to search SEPA carefully and whenever encountered should be ligated and cut before the exploration of SFJ [2].

According Henriet *et al* superficial external pudendal artery plays a significant haemodynamic role in vascularisation of erectile organs [3]. Rare complication such as impotence can also be seen in the cases of SEPA damage. However in our study of 50 patients we did not encounter to any such complication.

5. Conclusion

Our study showed that meticulous search and careful dissection can identify superficial external pudendal artery in almost every patient while exploring Sapheno-femoral junction. One must know anomalies of SEPA while operating such as its presence or absence and its number to avoid dreaded complication of hemorrhage.

SEPA was crossing posterior to SFJ in our maximum cases, hence it should always be remembered that SEPA can cross anterior as well as posterior to SFJ. In the absence of sufficient evidence, preservation of SEPA may not be feasible in every cases hence, one must ligate SEPA as soon as encountered while dissection. This will avoid inadvertent injury to SEPA causing torrential bleeding and further increasing post-operative complications.

6. References

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