

## Case Report

# An Unusual Venous Plexus on Psoas Major Muscle Connecting the Inferior Mesenteric and Testicular Veins

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### Abstract

Knowledge of communication between parietal abdominal veins, testicular vein and mesenteric veins is important for Surgeons, Urologists and Radiologists. These communications can result in varicocele or hemorrhoids and may lead to low success rate in hemorrhoid and varicocele surgeries. During routine dissection classes, we observed an unusual large venous plexus on the left psoas major muscle. The venous plexus was unilateral and was formed by many anastomotic venous channels on the psoas fascia and communicated with the left testicular and inferior mesenteric veins. The testicular and inferior mesenteric veins were significantly enlarged below the level of communication with the venous plexus.

**Keywords:** Psoas muscle, venous plexus, retroperitoneal, inferior vena cava, inferior mesenteric vein

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### Introduction

The psoas major muscle is one of the muscles of the posterior abdominal wall. This muscle is enclosed by a fascial sheath known as psoas fascia. The venous channels of posterior abdominal wall are well developed; especially those on the psoas major muscle. Within the psoas major these veins communicate with the intervertebral venous plexus through conjugate vessels. The venous networks of the posterior abdominal wall include iliolumbar, lumbar, gonadal, inferior mesenteric and ascending lumbar veins. The inferior mesenteric vein drains blood from the distal part of the large intestine. It usually terminates into splenic vein. The splenic vein unites with the superior mesenteric vein to form the portal vein. This vein can be dilated in liver diseases.

The testicular vein (gonadal vein) is vein draining the testis in males. On right side it drains to the inferior vena cava and the left testicular vein drains into the left

renal vein. Each gonadal vein begins as a network of veins, called the pampiniform plexus. There are many vessels contributing to this plexus. It ascends in the spermatic cord, anterior to the vas deferens. These vessels unite to form four veins below the superficial inguinal ring. These veins enter the abdominal cavity, passing through the inguinal canal and the deep inguinal ring. Near the deep inguinal ring these veins unite to form two veins, which run upwards on the psoas major, behind the peritoneum. These two veins unite to form a single testicular vein. Abnormal enlargement of the pampiniform venous plexus in the scrotum is known as varicocele. Varicoceles are more common in left side, as the left gonadal vein terminates in the smaller left renal vein compared to inferior vena cava at an angle of 90°. We observed an unusual plexus on psoas major that freely communicated with the veins draining the left ureter, testicular vein and inferior mesenteric vein. The testicular and inferior mesenteric veins were found dilated below the level of their communication with the plexus.

## Case Report

During dissection classes for medical undergraduate students, we observed an unusual large venous plexus on the left psoas major muscle. This was found in an adult male cadaver aged 65 years approximately and was unilateral (Fig. 1 and 2). The plexus was situated behind the parietal peritoneum. The plexus was formed by many venous channels on the psoas fascia. This plexus freely communicated with the veins draining the left ureter, testicular vein and inferior mesenteric vein. The origin, course and drainage pattern of testicular and inferior mesenteric veins was normal. However, the testicular and inferior mesenteric veins were significantly broad below their communication with the plexus. This dilation of the testicular and inferior mesenteric veins was possibly because of the venous stagnation due to their communication with the plexus.

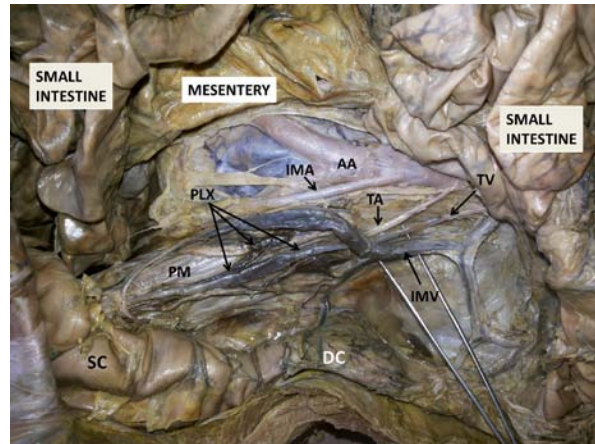
## Discussion

The collateral circulation formed by the testicular veins in retroperitoneal space has a great impact on varicocele surgery. Previous studies report the anastomosis of testicular and inferior mesenteric veins with various venous channels. In a study conducted on human foetuses, gonadal-periureteral anastomosis was noted in 23% cases; gonadal-perirenal anastomosis in 22% cases and gonadal-lumbar anastomosis in 7-37% of cases (1).

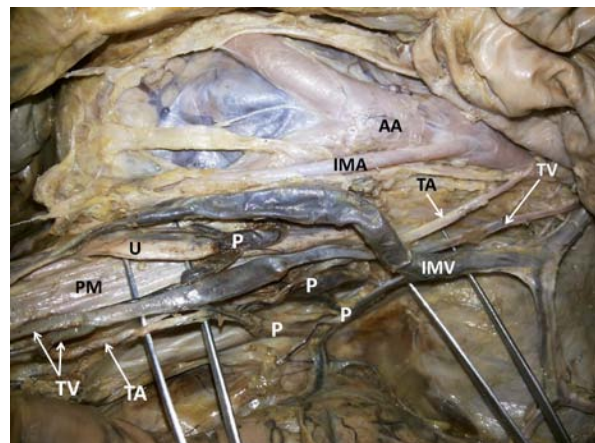
Developmentally supracardinal and vitelline veins are connected with subcardinal veins by a number of communicating channels in the retroperitoneal space. With postnatal persistence of these communication channels, collateral circulation is possible with veins draining ureter, kidney and inferior mesenteric veins in the retroperitoneal space (2,3). Knowledge of these anastomotic channels is important in the management of varicocele and infertility in men. These venous communications may be responsible for recurrent varicocele in men (4,5).

In the present case we found communication between gonadal veins, parietal abdominal veins and visceral veins. The communication between gonadal and visceral veins indicates the necessity for identification of the venous channels in surgical treatment of varicocele (4,5).

Previous studies show that the anastomotic channels of testicular veins are more common on left side than right. This may be because of the anastomosis of left testicular vein with the left renal vein, causing an increase in tension in the left abdominal venous tree



**Figure 1:** Dissection of the structures at the posterior abdominal wall. (AA – abdominal aorta; IMA – inferior mesenteric artery; TA – testicular artery; TV – testicular vein; IMV – inferior mesenteric vein; PLX – venous plexus; PM – psoas major muscle; DC – descending colon; SC – sigmoid colon)



**Figure 2:** Dissection of the posterior abdominal wall structures with a closer view of the venous plexus. (AA – abdominal aorta; IMA – inferior mesenteric artery; TA – testicular artery; TV – testicular vein; IMV – inferior mesenteric vein; P – venous plexus; PM – psoas major muscle; U – ureter)

(1,4- 8). Earlier researchers opine that an increase in tension in the left testicular venous channel stimulates the development of the venous plexus retroperitoneally (1,4-6). In our opinion the left sided venous plexus that we found on psoas major is possibly developed because of the venous insufficiency caused by the hypertension in left abdominal venous tree. It is important to know these kind of variation in the retroperitoneal space as it has a great clinical impact on sclerotherapy and operative procedure of varicocele. Though, there are many clinical and anatomical reports on communication between various

venous channels of posterior abdominal wall, reports on a venous plexus formation on the psoas major muscle and its communication with inferior mesenteric and testicular veins are lacking. The enlargement of the testicular and mesenteric veins below the level of communication indicates that this plexus would have had a role to play in venous congestion below the level of communication.

### Conclusion

The abnormal plexus on psoas major muscle might result in venous stagnation in the testicular and inferior mesenteric veins and lead to varicocele or haemorrhoids in a long run. Hence, this case is noteworthy to Vascular Surgeons, Radiologists and Urologists.

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