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Easy mesh fixation to the promontory during sacrocolpopexy procedure

Short title: mesh fixation and sacrocolpopexy

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Conflict of interest: none

Abstract:

We propose a simplified technique to approach the promontory and to fix the mesh on the anterior longitudinal ligament during the sacrocolpopexy procedure by using an instrument initially designed for the vaginal approach of the sacrospinous ligament. **Using this easy technique in case of anatomic variations on the sacral promontory** may avoid complications.

Key words : sacral promontory ; sacrocolpopexy ; ureter; vascular anatomy; mesh; laparoscopy

Introduction:

The approach to the promontory during laparoscopic sacrocolpopexy may sometimes be particularly delicate with vascular and / or ureteral wound rates of up to 4.4% and 1% respectively [1, 2]. Its dissection is however essential to fix the mesh. The anatomical studies have made it possible to demonstrate the proximity of the vascular and ureteral structures to the site of fixation, particularly in three dangerous structures (because of their proximity): the left common iliac vein, the right ureter and the right internal iliac artery [2]. The average distance between the left common iliac vein and the promontory is 27 mm (extremes vary between 9.5 and 47.5 mm). The average distance between the right ureter and the promontory is 27 mm (the extremes vary between 16 and 48 mm). The average distance between the right internal iliac artery and the promontory is 25 mm (the extremes vary between 14 and 39 mm) [2]. There is also the proximity of the hypogastric nerve and the sacral plexus (between 15 to 30 mm from the promontory) [2, 3]. Moreover, the

abundance of pre-sacral fatty tissue could complicate the precise identification of these different vascular and ureteral elements.

We had the idea of using the Capiro™ Slim device (Boston Scientific™, Marlborough, USA) which allows sacrospinous fixations to be carried out vaginally (Fig 1A and 1B). It is easy to introduce this device through the suprapubic incision **or via a 15 mm trocar**. The radius of curvature of the Capiro™ Slim head makes it very easy to pass a suture through the anterior longitudinal ligament on the sacral promontory in one step.

Surgical technique: Figures 1 to 3

The patient is set in supine position, in Trendelenburg position and the digestive loops displaced, under general anesthesia, with oro-tracheal intubation, the legs apart in flexion of 30 °, the two arms along the body, the buttocks slightly overhanging the operating table, the catheterized bladder.

Four trocars are required: a 12 mm umbilical trocar for the laparoscope, two 5 mm trocars in the right and left iliac fossa two fingers across the antero-superior iliac spine, and a 10 mm suprapubic trocar **or a 15 mm suprapubic trocar (in case of the surgeon wants to put the Capiro™ Slim device through the trocar)**.

Dissection of the promontory requires exposing perfectly the anterior vertebral ligament by first identifying the vascular and ureteral structures to be preserved. The dissection space is limited in width, corresponding to the dimensions of the head of the Capiro™ Slim

device. The needle is inserted into the Capiro™ Slim device (Fig 1B). The 10 mm suprapubic trocar is removed. The Capiro™ Slim device is introduced through the same skin incision (Fig 1C and 1D). **Another possibility is the use of a 15 mm suprapubic trocar in which the Capiro™ Slim device could be introduced.** The assistant in surgery must place his finger with a gauze on the skin incision to avoid losing the pneumoperitoneum. The Capiro™ Slim device is applied to the anterior longitudinal ligament (Fig 2A). The operator presses the plunger to insert the needle into the ligament (Fig 2B). Then surgical forceps removes the crimped wire from the throat of the device head (Fig 2C). The Capiro™ Slim device is completely removed and the 10 mm trocar replaced. We can then check that the grip is satisfactory by pulling the two strands (Fig 2D). The strands are then inserted into the mesh (Fig 3A and 3B). The thread is tied internally or extra-corporeal with the knot pusher (Fig 3C and 3D). The rest of the intervention is similar to a conventional sacrocolpopexy [4].

Conclusion:

Using the Capiro™ Slim device is simple, quick and will effectively fix the mesh on the anterior longitudinal ligament of the sacral promontory. Its use in this indication is being evaluated in our department and may be of service when the dissection of the headland is limited in size because of anatomic variations. It could therefore avoid vascular or ureteral complications. We recall the need for a perfect knowledge of the anatomy of the lumbosacral region and its variability.

Conflict of interest: none

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Caption:

Figure 1:

Fig 1A: Capio™ Slim device (Boston Scientific™, Marlborough, USA)

Fig 1B: pressure on the pusher brings the needle out of the device head

Fig 1C: introduction of the device through the suprapubic incision

Fig 1D: laparoscopic view of the insertion of the device

Figure 2:

Fig 2A: application of the Capio™ Slim device on the anterior longitudinal ligament

Fig 2B: the operator presses the plunger to insert the needle into the ligament

Fig 2C: the crimped wire is removed from the throat of the device head

Fig 2D: traction of the strands to check that the grip is solid

Figure 3:

Fig 3A and 3B: The strands are inserted into the mesh

Fig 3C: extracorporeal suture to the knot pusher

Fig 3D: final laparoscopic view





