

Lecture N. 17

Hernioplasty with inguinal preperitoneal mesh

The title and topic of this Lecture derive from what was already presented in Lecture no. 4, “*Physiopathology of the Inguinal Region*”, and in particular from the insight of Edoardo Bassini into the importance of the transversalis fascia (TF), inasmuch as it constitutes a fundamental element of the retentive systems of the inguinal hiatus and, consequently, plays a primary role in the pathogenesis of inguinal hernia.

With the advent of prostheses made of biocompatible mesh and above all free of the drawbacks present in materials used until then (also by us) we had a longstanding and rich experience in the treatment of hernias with Bassini’s approach, as did for that matter most surgeons. We had also ascertained that the more accurately the operation was performed according to the Author’s indications the better the results of Bassini’s repair were. In particular, we had found that numerous surgeons, rather than executing the prescribed “*triple layer*”, did not intervene on the transversalis fascia (TF), thereby creating a “*double layer*”, that is, the use of only the internal oblique and transverse muscles for repair purposes without the opening and involvement of the TF, whose importance was overlooked because of its apparent exiguity. Indeed, it was thought that opening the TF would further weaken the medial fossa. Still another maneuver not always performed, or at least not always correctly, was the point of anchorage on Colles’ ligament.

The availability of mesh prostheses led us initially to perform techniques with an inguinal access according to Lichtenstein, or with video-assisted laparoscopic access. We immediately realized that the two repair methods heeded dramatically different pathophysiological criteria: the former constituted a “*lid*” that, applied externally to the inguinal hiatus and pushed by endoabdominal pressure, ran the risk of being “*blown off*”; with the laparoscopic approach, the “*lid*” was positioned within the “*inguinal aperture*”, spread well beyond the margins of this latter and with a hold suitable to withstand endoabdominal pressure.

Starting with these considerations, given the tolerability of the prostheses, from accounts by Lichtenstein and followers, aware of works by Rives, Stoppa, Nyhus and many others, and recalling the advantageous principles of Bassini’s technique, we deemed it possible to merge all of these criteria in order to achieve a valid operation that could contain the inguinal hiatus by means of the reinforcement of the TF only. This could be achieved via an inguinal access, opening the TF and laying the prosthesis broadly beyond the section margins of the TF in the preperitoneal space behind it. As mentioned above, other Authors (Nyhus, Rives, etc.) had attempted this approach, but each with variations that, in our view, were not so convincing. The video-assisted laparoscopic technique utilized in this case, although compliant with our principle of choice, was subsequently replaced by an inguinal access, which, in our opinion, offered better guarantees in terms of lowered operative risks, use of local anesthetic, speed of execution, and a more rapid patient recovery with the quicker hospital discharge that ensues (day surgery).

Hernioplasty with inguinal preperitoneal mesh (IPM), a procedure which we have studied and verified, responds to requirements worthy of being emphasized:

- a) it presents features of tension-free repair;
- b) it covers from within the entire area of inguinal weakness;
- c) it substitutes the TF, in keeping with Bassini’s teachings;
- d) it complies with the other condition imposed by Bassini’s procedure, i.e., the use of Colles’ ligament; moreover, it closes the femoral canal from within, similarly to variants of Cooper’s ligament repair, but without the drawbacks that these present. As a result, prophylaxis of a crural hernia - a not so rare event following inguinal hernia repair - is achieved.

The stages of intervention - **see accompanying video**:

- 1) Local step-by-step anesthesia;
- 2) Inguinal incision;
- 3) Section of the subcutaneous sheath (*innominate fascia*) and exposition of the aponeurosis of the external oblique muscle;
- 4) Identification of the superficial inguinal ring and section of the aponeurosis;
- 5) Isolation of the spermatic cord and section of the cremaster muscle;
- 6) Isolation of the hernia sac;
- 7) Section of the TF;
- 8) Reduction of the hernia sac and treatment of this if large;
- 9) Identification of the pubic tubercle and of Colles' ligament;
- 10) Identification of Cooper's ligament
- 11) Separation of the TF from preperitoneal fat (Bogros' space);
- 12) Separation of the inguinal ligament, revealing the iliac vessels;
- 13) Preperitoneal application of polypropylene mesh, tailored according to need, fixed with two continuous stitches *a greca*, like a *mattress suture*, in polypropylene monofilament to the transversalis fascia and to the inguinal ligament, both anchored to Colles' ligament. The two sutures are not applied at the edge of the mesh, but at a certain distance from this; as a result, the mesh overlaps well beyond the section margins of the TF and of the inguinal ligament.
- 14) Proof of hold (cough);
- 15) Suture of the aponeurosis of the external oblique muscle, of the subcutaneous sheath, and of the skin.

As can be observed in the video, the mesh is first fastened to Colles' ligament and is then spread manually so that it lays flat without folds medially in Bogros' space and laterally in the lacuna (*femoral lacuna*) between Cooper's and the inguinal ligament. The sutures serve the purpose of holding the mesh in the correct position without folds. Operating times generally do not exceed an hour. The patient is able to walk a few hours after the operation, and is discharged the same day or the following day (24 hours later).

The only disadvantage in some terms of immediate postoperative sequelae is inguinal-scrotal hematoma in cases of complex, large or recurrent hernia. This complication, though rare, always resolved spontaneously, however, and never impacted on hospitalization times.

Our study on the treatment of inguinal hernia included the long-term follow-up of patients with the verification of results of not only intervention with IPM, but also of Lichtenstein and Bassini repair procedures. We found that at one month after surgery 0.6% of IPM patients experienced pain, 2.7% of patients who had undergone a Lichtenstein repair felt discomfort, while no patients subject to a Bassini procedure complained of pain. Many Authors have postulated that long-term pain depends on the trapping of nerves in the prosthetic mesh: the low incidence of this inconvenience seen with IPM could be explained by the fact that with this procedure the prosthesis does not come into contact with nerves. Recurrence rates were 0.6%, 1.33% and 4.8% with IPM, Lichtenstein and Bassini repairs, respectively.

We also applied IPM repair for the treatment of recurrent hernias. There's no doubt that re-operation via an inguinal access presents certain difficulties owing to scarring processes and to modifications induced by previous intervention, with an understandably longer (though negligible) duration required for the procedure. Nonetheless, at least as far as our experience is concerned, these drawbacks are easily resolvable and offset by unquestionable advantages: the re-definition of anatomical features; direct control of defect (s) (local anesthesia expedites such control by allowing

the increase of abdominal pressure on command); accurate visualization of the hernia sac(s), its (their) characteristics and contents.

This procedure clearly shares with similar approaches noteworthy rewards in terms of health care cost savings: simple, low-cost prostheses, early patient discharge (thereby making day surgery possible), and above all - differently from other techniques - a low recurrence rate (2.5% for IPM vs. 6.6% for Lichtenstein repairs). These features make IPM the procedure of choice also for recurrent hernias with respect to video-assisted laparoscopy, which, although efficacious for the treatment of recurrence, is nonetheless burdened by greater invasiveness and higher costs.

Conclusions

The wealth of literature dealing with inguinal hernia that has accrued over the years, as well as the countless anatomic-functional interpretations that have given rise to a parallel number of novel surgical variations and ever more elaborate and costly prosthetic systems, prompted us to take up the issue by starting from the origins, i.e., by following the approach that Bassini originally proposed. Indeed, his teachings vividly remind us of the pivotal role played by the transversalis fascia in determining inguinal containment and the value of the surgical techniques based on its reinforcement or substitution.

Our results from clinical studies, which put to the test procedures entailing the application of prostheses via an inguinal access in front of the inguinal falx (Lichtenstein) and preperitoneally behind the transversalis fascia (IPM), confirm the validity of this latter. The same method also yielded positive results for the correction of recurrent hernias.
