INGUINAL HERNIALLOPLASTIC BY ANTERIOR ACCESS USING A MODIFIED FORM OF THE VALENTI TECHNIQUE. PRELIMINARY RESULTS OF OUR EXPERIENCE

ANGIO’ L.G., PIRRONE G., CAMPOLO V., DE CARIDI G., SANTAGATI C., FAMULARI C.

University of Messina – Institute of Clinic Methodology and Surgical Therapies – Department of Emergency Surgery


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The rational therapeutic option for primitive inguinal hernia is surgical treatment and the same presence of the disease, which causes any degree of discomfort, is an indication in favour of operating. Recently there have been radical changes in hernial surgery. Surgeons, having critically valued “traditional tissue approximation repair”, have attributed its failures not only to technical defects, but also the reconstruction under tension is a substantial basic error, which violates a fundamental principle of surgical technique, consisting in approximation by means of the suture of structures of a different nature which are not anatomically juxtaposed, and ever occasionally separated by a considerable distance.\[13, 15, 28, 29, 30, 31]\.

Recent physiophatological acquisitions have brought to light a primitive, intrinsic fragility of the muscular-aponeurotic structures of the inguinal floor, which is responsible for their collapse and for the appearance of a primitive hernia, characterized by a metabolic involutionary disorder of the collagen and elastic fibres of the fibrous connective tissue. Peacock (21) and Read (25) have noted morphological and biochemical evidence, at the level of the transversalis fascia, of this deficit (alteration of the normal periodicity of the collagen fibrils, reduced content of hydroxyproline, abnormal lipidic infiltration) and they have indicated that in order to repair a parietal hernial defect, it is not surgically correct to use the unsuited tissues of the patient, as there is a risk of failure (13, 15, 21, 28, 29, 30, 38).

On the basis of these observations, the Bassini operation, the most generally practiced in hospitals all over the world for more than 50 years, has been brought into question and it has been felt necessary to seek appropriate surgical techniques in order to resolve the above mentioned mechanical and biological problems, and thus to guarantee a reduction of relapses. This has led to the introduction of innovating methods, in alternative to the traditional ones, which, thanks to the potentialities of modern technology, can avail themselves of the use of
biocompatible synthetic prosthesis, which have radically changed the philosophy of the therapeutical approach to hernial pathology.

Prosthetic hernioplasties, initially mistrusted by surgeons because of the prejudice using extraneous material, have been increasingly applied and as a result of the installation of biomaterial (“patch or plug repair”), and therefore without having to make recourse to the use of pathologically altered tissues, have guaranteed the obliteration of the hernia defect and the stabilization of the deep level of the inguinal canal without any undesired tension (“tension free hernia repair”). These techniques are based on the principle that once the bioprosthesis has been placed between the weakened tissues, it permits, by means of an immediate and rapid fibroblastic response and by respecting the anatomy and physiology of the region, a solid and resistent parietal reconstruction and determines a permanent reinforcing process on the floor of the hernial tract, providing resistance, like a retention barrier, to the force of pressure exertised by the abdominal content.

The repair of the inguinal region thus realized complies with the physiopathological problems of hernial pathology and can be considered as the principal mean of treating hernias and of preventing relapses, the incidence of which is reduced to less than 1%.

Moreover, in the light of the ever-increasing experience and case-histories, hernioplasties with prosthesis seen to comply with the objectives of modern surgery, that is of “day-surgery”: simple and rapid technique, minimum “discomfort” for the patient (slight postoperative pain, immediate mobilization, early discharge from hospital, prompt and easy resumption of physical and working activity, a low rate of morbility both in the immediacy (2%) and delayed (< 1%), low social and health costs, good standardization.

The techniques, even if widely tested, may still, in effect, be considered susceptible to improvements (conformation of the prosthesis, seat and modality of their positioning, etc.) in order to obtain the best results. Moreover, the fact that the surgeon has at his disposal a wide range of possible ways of operations, diversified in certain technical aspects, but which do not require substantial modification of the principles of the treatment, is certainly an advantage in that it offers the possibility to approach each specific situation in an eclectic way, selecting the best technical option, in consideration of the multiplicity of the characteristics of single patients and single hernias.

Very recently, Valenti (35, 36, 37) has elaborated a method for the surgical “tension-free” treatment of primitive inguinal hernia, both indirect and direct with anterior access, based on the principle of the “Total Dynamic Barrier”.

This technique requires the use of a complex prosthesis (“Dynamic Self-regulating Prosthesis”, “D.S.R.P.”), which consists of two layers of polypropylene, made into a mesh and preshaped, of the same form and dimensions, which are positioned between the aponeurosis of the external oblique muscle and the floor of the inguinal tract on two different parallel levels and are sutured only on one side, with muscular-aponeurotic structures of the inguinal canal opposed to each other.

The lower prosthetic layer, which has a vaguely trapezoidal form, presents a hole for the passage and the lodging of the spermatic funicle which is surrounded by at its origin; its side
edge is placed parallely without sutures to a tract of the inguinal ligament, while the two ends of the medial edge are anchored by means of a polypropylene stitch to the sheath of the rectus muscle of the abdomen, becoming joined to its movements.

The upper prosthesic layer, overlapping the previous one, has larger dimensions and vaguely recalls the form of the inguinal floor which it covers; its lateral edge, which presents, about half-way along, a semilunar incision to allow for the passage and the superficialization of the spermatic funicle, is sutured to the inguinal ligament with a number of polypropylene stitches above and below the above-mentioned incision, while the medial edge is positioned freely on the sheath of the rectus muscle below the aponeurosis of the big oblique muscle in the same way as the upper edge which over overhangs the internal inguinal ring and the lower edge, overlapping the pubic tubercle by 1-2 cm.

The two layers, which are reciprocally independent, slide one over the other, which allows the whole prosthesis itself to adapt dynamically to the anthropometrical variations of the inguinal region and also to the anatomy of the inguinal canal and to the physiological variations (upright position, muscular exertion) in the relations between the various muscular-aponeurotic structures and thus to the variations of form and volume in the inguinal region without tension and traction during muscular activity, while preserving its elasticity and dynamism.

By means of this “dynamic self-regulation”, that is of the static and functional adjustment of the inguinal region, the barrier-action of the “D.S.R.P.” with regard to the force of pressure exercised by the abdominal content on the inguinal floor is total (“Total Dynamic Barrier”). In fact, it gives beyond the limit of the Hesselbach triangle, and this is the basic factor which ensures its effectiveness over a length of time, as the degenerative process, which causes the hernia, extends well beyond the anatomical limits and can cause new hernias to form even at a distance of years after the first operation. It must also be considered that the lower prosthesic layer creates a new internal inguinal ring which, rather like a sling, protects the original deep orifice from the possibility of a new herniation, both thanks to the structural reinforcement and also as a result of the restored natural defence mechanism “shutter” during muscular exertion.

Compared with other hernioplastic prosthesis which in addition to the use of a single “patch” also include the insertion of a “plug” in the parietal defect, Valenti’s technique has no need of the insertion of a “plug” in the preperitoneal space as a result of the potential morbility related to it (displacements, migrations and decubitus on the vascular and visceral structures).

**Rational of the proposed variation of the original Valenti’s method**

In our opinion, the Valenti’s technique is limited by the hypothesis that the author makes considering the “D.S.R.P.” in its function as a curative treatment of the hernia defect and as a barrier to the pressure exerted by the abdominal content, and excluding any prosthesic correction is the preperitoneal space, as it is considered not only unnecessary but harmful.

Based on the assumption that, on the base of the Pascal principle, the preperitoneal space is the most suitable area to offer effective resistance to the interabdominal pressure, we believe that it would be more correct to assign to the two prosthetic epifascial layers used by Valenti only for
its efficacious, permanent and total structural reinforcing action on the inguinal floor, useful is preventing the recidivist engagement of the hernial sac, but we consider that the action carried out by a preperitoneal “plug”, is synergistic and complementary, and that its insertion is indispensable both for the retention function it exerts with regard to the recidivist engagement of the hernial sac and for purposes of treatment in repairing the parietal defect.

Using a “plug” in prosthetic hernioplastic has always been considered useful in correcting the primitive hernia and in preventing relapses, as once it has been inserted deep into the parietal defect, that is in the preperitoneal space, it comes out a profound “tension-free” action of retention; under the influence of the natural intra-abdominal pressure, to which it offers opposition, it tends to wider, filling and so blocking the hernial door by means of its volume and thus impeding the release of the hernial bag after it has been reduced (11, 31). The fibrogenetic function attributed to the “plug” in the preperitoneal region would not appear to be effective, since the newly-formed fibrotic tissue is subject to the same metabolic disorders as the collagenic and elastic fibres which were the cause of the primitive hernia (22).

The main criticism referred to “plug repair”, which apparently resulted in Valenti’s decision to abandon it, regards rather more than the risk of deep infections, that of the dislocation, the migration and the decubitus of the “plug” with regard to the adjacent organs (intestine (7, 8, 10), bladder (2, 3, 6, 7, 8), vessels (6, 7, 8)). These complications seen linked to the incorrect positioning of the “plug” as a result of a mistaken or unsuccessful fixing, or to its possible insufficient dimension, considering also that after the implant, as a result of a process of incorporation in fibrotic tissue, its dimension can be reduced by as much as 75% (“structural coartation” (2, 3, 22)); moreover, over a period of time the “plug” takes on a consistency of a cartilaginous type, with the danger of producing erosions and perforations in the organs with which it comes into contact.

Schulman (28, 29, 30) and Linchtenstein (16) do not report cases of migration of the “plug” to any distance, and a similar result has been related by Rutkow (26, 27) in the case-histories of more than 3200 “mesh-plug repair”; The dislocation/migration of the “plug”, according to Negro (18) who has reported 10 cases of dislocation in a total of 19700 operations (19, 20), is a rare and entirely marginal event.

Experimental evidence has shown that prostheses which are not reabsorbable nor well outspread and collapsed, in the same way as a dart-shaped “plug”, tend to suffer more from the pressure caused by the reaction of the fibroblastic action and so lose their retention function, and unless they are fixed they more easily tend to be dislocated (7, 8, 22), just as there is also an increased risk of infection.

Moreover, the exclusive retention function attributed to the “plug” cannot be performed by the epifascial layers of the “D.S.R.P.”, as the normal intra-abdominal pressure may be impeded more successfully by a prosthetic subfascial element, on the surface of which -much larger than the area to be covered- it may be distributed in a more uniform fashion.

In the light of such premises we are convinced that the epifascial implant of the “D.S.R.P.” must be accompanied by posterior insertion to the transversalis fascia, a circular-shaped as a disc “flat plug” in modelled polypropylene, of slightly greater dimension compared with the
parietal defect - 4/5 cm diameter -, anchored by with a single stitch to the top of the hernial sac, which acts exactly like a real patch located in the preperitoneal space. In conclusion, we propose a prosthetic hernioplasty which is the fruit of the integration of several phases in the operating methods of Valenti and Trabucco, but above all of several prosthetic aids of which they make use respectively the “D.S.R.P.” and the “Flat Plug”, both of which we utilize for their different finalities both in treatment and prevention.

The rational of the variation we propose is in practical terms manifested in the application of certain particular technical devices, which reveal themselves to be fundamental and salient phases of the operative approach and which permit a maximum use of the integrated potentialities of the two prosthesis employed and which guarantee protection from the sporadic complications.

We have decided to utilize this kind of technical compromise in our clinical practice, in order to evaluate its correspondence to the requisites of minimum invasive effects, high compliance, low morbidity, effectiveness over time and low costs, requires which today we required of prosthetic repairs of inguinal hernias.

**Patients and Methods**

From April 1999 to September 1999, at Department of Emergency Surgery of the Messina’s University, 28 male patients, aged 24 to 67 years (mean, 44.6), with primitive uncomplicated inguinal hernia, previous informed agreement, underwent “D.S.R.P. and Flat Plug hernia repair” by local anaesthesia. Sixty per cent had a sedentary work and forty per cent had heavy manual work. In 23/28 cases (82.1%) the treatment was monolateral and in 5/28 cases (17.9%) the treatment was bilateral. At the time of surgical approach was identified 21/33 (63.6%) external oblique hernias and 12/33 (36.4%) direct hernias. Moreover, 9/33 hernias (27.3%) were classified as small dimensions, 15/33 hernias (45.4%) and 9/33 (27.3%) were respectively classified as medium and big volume.

All patients who had previously been subjected to a surgical visit in ambulatory and to routine preoperative enquires, had been hospitalized the day before the surgical operation, mobilized after some hours and discharged during the first postoperative day. We haven’t programmed the surgical approach neither on regimen of “Day Surgery” nor of “One Day Surgery” due to reasons of organization and of opportunity and because these are the first clinic experiences which are performed thanks the method that we have set up.

The surgery “follow-up” program (6 months at least; 1 year maximum) which has been carried out on all the operated patients, provided for close checks on alternate days during the first 10 days of the postoperative period in order to understand on time the arising of possible immediate complications and checks that were programmed after 15 and 30 days after the operation, and after, every two months to check the appearance of possible series to be attributed to the prosthetic implants and in order to evaluate the holding of the hernioplasty.
Results
The small amount of the treated patients and the short period of “follow-up” don’t allow us to express a definitive opinion about the results which have until now obtained by using the “D.S.R.P and Flat Plug hernia repair”. Their preliminary testing, however, gives us reason to be amply satisfied: the operation is easy and of quick execution, agreeable for the patient thanks to the light postoperative “discomfort” (precocious deambulation 2-3 hours after the operation; only 18% of the patients have asked for analgesics owing to postoperative pain lamented in the seat of the wound and also limitedly to the first 24 hours after the operation; a quick functional recovery with a renewal of the working sedentary and heavy activity after 2 and 5 days onthe average respectively, so nearly annulling or considerably reducing convalescence), safe as regards the risk of complications up to today completely absent, efficacions regarding strenght and holding, because at a short distance there have surely not been found recidivations in those patients that have been checked 6 (23/28) and 12 mounths (5/28) after the operation.
The obtained results need obviously to be ulteriorly confirmed on a far wider casuistry and with a longer “follow-up”, but a definitive assessment on the effectiveness and on the safety of the hernioplastic “D.S.R.P and Flat Plug” will not be able to leave out of consideration an objective comparison between this one and the two methods (Valenti and Trabucco) of whom it makes up the technical compromise; it will also allow the standardisation of the necessary procedure to its adoption in clinical practice.

Conclusions
The surgical history of the hernia shows that every age has had its “golden therapeutic standard” that has kept as long as a new proposal has singled out its limits giving better results. The “patch and plug” prosthetic hernioplasties, among which one must include the “D.S.R.P and Flat Plug hernia repair” are the result of this evolution of whom they represent the most present proposal, but certainly not the end-point of modern herniology that has to verify objectively the results, ready to accept eventual new solutions.
In this way we must understand the acquisition of our experience of Valenti’s technique and the alteration of it which have proposed, and that would precisely like to be, an expression of that process of methodological evolution followed by the principles informing the present hernialloplasties, each with its own intrinsic validity, with the aim of the acquisition of new procedures and not of the refudrations of the operations of Linchtenstein and Trabucco that have undoubtly set the anatomofunctional bases for the rational treatment of the hernias by prosthesis.

Summary
The authors dwell upon the deep changes which the surgery of the inguinal hernia has recorded in the last years with the aim to reduce the rate of relapses and based on the philosophy “tension free repair”, particularly on the prosthetic “patch and plug” hernioplastics which represent the evolution of this concept and among these must be includes the “D.S.R.P and Flat Plug hernia repair”, that they have set with a sort of eclecticism and of integration of some of
the operation times of Valenti’s and Trabucco’s methodologies and of some prosthetic protections used by themselves. Then, they dwell upon the rational of the variant in the Valenti’s original technique put forward them and this variant arise from a critical testing they perform their preliminary clinic experience about primitive inguinal hernia repair through the methodology that has been proposed, then they declare that they can confirm it from the point of view of the effectiveness and safety only after further confirmations based on far wider surveys and on longer “follow-up” and after an objective comparison between this one and the two methods of whom it forms the technical compromise.

Keys words: Inguinal Hernia – Prosthetic Surgery – Dynamic Self-regulating Prosthesis – Flat Plug

Bibliography


