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Surgical technique: scrotomectomy and plasty of the scrotum in the surgical treatment of large hydroceles in lymphatic filariasis endemic countries

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ABSTRACT

This work describes the various methods of resection-plasty of the excessive scrotum that we developed and use as a complement to the resection of the vaginalis in the surgical treatment of large and very large hydroceles in filarial endemic countries. Patients/Methods: The procedures described have been developed during 12 years of practice in lymphatic filariasis endemic countries. They were formalized in a recent series of 50 resection-plasty of the scrotum, complementary to hydrocelectomy, in a homogeneous and continuous series of 148 hydrocelectomy performed on 117 patients by the same operator in Fiji (2009-2011). The results of this series are reported elsewhere. The encouraging results seem to justify the description of the techniques used in its different variants.

INTRODUCTION

During our long practice of surgery in several Pacific countries endemic for lymphatic filariasis, we noticed that the peroperative and/or postoperative retraction of the scrotum after hydrocelectomy does not always materialize, contrary to a commonly held belief.

The persistence of a too large scrotum for an intrascrotal content which returned to its normal or subnormal volume after hydrocelectomy, must be kept in mind. The aesthetic embarrassment it causes is sometimes admitted by the patient and is real.The functional impairment, most often unacknowledged, cannot be ignored. The literature does not offer any surgical technique for the plasty of the excessive scrotum that could be called the "silent burden" of patients who had a hydrocelectomy.

SURGICAL TECHNIQUE:PLASTY OF REDUCTION OF THE SCROTUM

This work is the result of 12 years of practice of "extended" general surgery, first in the continuity and then through regular missions in countries endemic for lymphatic filariasis. We already reported our conclusions and our proposed clinical classification of hydroceles[1].We also already commented on the clinical examination and surgical treatment of large and very large hydroceles in lymphatic filariasis endemic countries [2].

The quality of the results, despite some usual postoperative complications which remain within those published in the literature, justify this work that might be of interest to surgeons.

Principle

Like a healthy scrotal mass, the hydrocelic scrotal mass can generally be considered as a sphere.

One can distinguish :

- an upper pole and a lower pole;
- the front half limited by: an anterior meridian at the front and two medio-lateral meridians (a right one and a left one) at the back. The anterior and the two medio-lateral meridians are separated by two antero-lateral meridians: one on the right and one on the left side;
- the back half limited by:a posterior meridian at the back(which is the prolongation of the anterior meridian on the back half) and the same two medio-lateral meridians as above, but at the front of the posterior meridian. The posterior and the two medio-lateral meridians are separated by two postero-lateral meridians : one on the right and one on the left side.
- Therefore for example, on the right side between the medio-lateral meridian at the front and the postero-lateral meridian at the back we distinguish a right postero-lateral section.And between the postero-lateral meridian at the front and the posterior meridian at the back we distinguish a right posterior section.

These benchmarks guide the pattern of resection plasty exposed. These resection-plasty of the scrotum are peformed during the same operation as the hydrocelectomy, which is made by emptying the pathological content and the total resection of the vaginalis. The purpose of the resection-plastyis two fold : to decrease the volume of a hollow sphere by decreasing its surface through a more or less extensive resection of the bag,

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while maintaining or restoring a sphericity, as close as possible to normal, to the scrotal mass. This can be achieved by changing the sagitta of each circle arc that each curve represents in polycurvesplasty.

Hence, to raise the lower pole of the right hydrocelic purse above the lower pole of the left purse, which is not affected by a hydrocele or which has a hydrocele of a lower stage, the sagitta of the curves on the antero-lateral and postero-lateral sections on the right side will be longer than the ones on the left in order to take a larger area on this side of the scrotum.

Technique

Incision

The incision is located halfway between the two poles. It is curved with a lower or upper concavity, arranged horizontally on the front of the purse concerned, respecting the median raphe. If necessary the incision can be antero-laterally enlarged. In hydroceles stage III or IV, the incision is anterolateral. If the necessity of a resection of the scrotum is confirmed by an insufficient or an absence of scrotal tonicity after treatment of the hydrocele, the incision is enlarged towards the back on the postero-lateral and posterior sections of the purse concerned. A lower contra-incision is made following a parallel design. The distance between these two incisions is variable depending on the extent of surface of excessive scrotum to be removed. If a resection of the scrotum is anticipated, the drawing of the incision line is done before the beginning of the operation according to the type of plasty considered.

Methods: the different types of resection-plasty of the scrotum

We use two main categories of resection-plasty: *unilateralplasty* focusing on one purse only or *bilateral plasty* including the two purses. Each group includes several types of plasty.

Two concepts must be kept in mind:

- the contraction of the scrotum,even limited, may continue after surgery,
- the scrotum of elderly is less retractile, with some exceptions. It is the same for the underlying dartoic bag which is also resected.

The incision and contra-incision lines should bewinding without acute angles between curves. As much as possible, a preliminary drawing should be done on the scrotum.

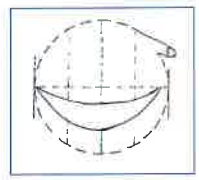
Unilateral resection-plasty

They are indicated in unilateral hydrocele and extend from the anterior meridian (median raphe) to the posterior meridian of the purse concerned.

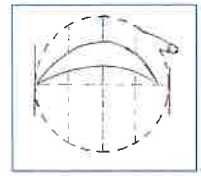
According to the drawing of the line of incision and of the flap to be resected we distinguish three types of plasty: in lying crescent moon, in lying *italic* S, in "chapeau de gendarme".

1) Resection-Plasty Antero-Latero-Posterior (PALP) uni-curve in "lying crescent moon"

The resection concerns the anterior, the antero-lateral, the postero-lateral and the posterior sides of the purse: from the anterior meridian (median raphe) to the posterior meridian. Thus, we get the following designs and resection-flaps: in crescent moon with a superior concavity: "crescent moon lying on its back." The resection concerns the lower hemisphere of the purse. Figure 1

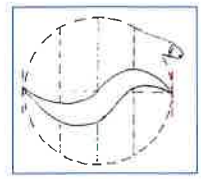


- in crescent moon with a lower concavity: "crescent moon lying on its stomach." The resection covers the upper hemisphere of the purse. Figure 2

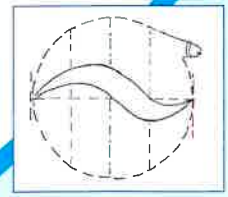


2) Resection-Plasty Antero-Latero-Posterior (PALP) bi-curves initalic "S"

Here, the incision draws a lying italic "S" extending horizontally from the anterior meridian to the posterior meridian, straddling the equator line, centered by the medio-lateral meridian. There are two types of flaps: "normal" italic "S", looking down. Figure 3



- "inverted" italic "S", looking up. Figure 4

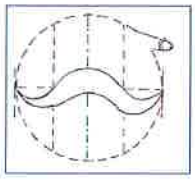


Theexcised flap (operating piece) as the shape of an italic "S".

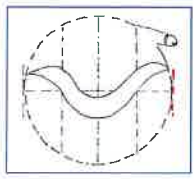
3) Resection-Plasty Antero-Latero-Posterior (PALP) tri-curves in « chapeau de gendarme »

The incision line is even more winding than in the two previous types of resection-plasty. It describes three successive curves, one on each side of the purse concerned from the anterior meridian to the posterior meridian. We describe two types of flaps:

• "chapeau de gendarme" Figure 5



• "reversed chapeau de gendarme." Figure 6



As in previous plasty, the shape is drawn based on the anticipated design before resection. The operating piece will have the same shape.

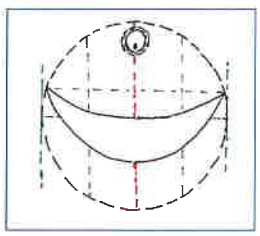
Bilateral Antero-Lateral Resection-Plasty (BAL)

These scrotomectomyconcern both sides of the scrotum. Developed for bilateral hydroceles, they may also apply in particular cases to unilateral hydroceles. They concern the anterior and anterolateral sides of both purses, from one medio-lateral meridian to another. They do not include the postero-lateral and posterior sides. We identify two types.

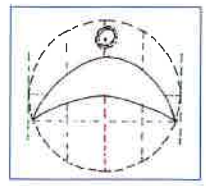
1) " Lying crescent moon "BAL

The resection-plasty concerns both front sides as well as the left and right anterolateral sides. The incision extends from onemedio-lateral meridian to the other. It has an upward or downward concave curve, centered on the anterior meridian (median raphe). The contra-incision follows the same design. Incision and contra-incision draw either:

• a "crescent moon lying on its back": in this case the upper limit (incision) is at the level of the equator. The lower limit of resection is on the lower hemisphere. The resection focuses mainly on the lower hemisphere Figure 7



• a "crescent moon lying on his stomach": the lower incision does not go above the equator level. The upper contra-incision limits on top the resection flap Figure 8



2) Tri-curves BAL.

Here the design of the incision, extending on the anterior and anterolateral sides of each purse, is a succession of alternating up or down concave or convex curves. The upper incision corresponds to the initial incision. It extends from a medio-lateral meridian to the other, without expending behind it while describing a sinuous line centered on the medio-anterior meridian.The distance of the inferior contra-incision depends on the surface of scrotum to be removed. It follows the same design as the former incision and joins it on both ends, on themedio-lateral meridians.

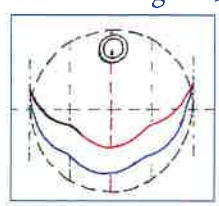
We distinguish two main groups of tri-curves BAL depending if the flap- possibly mobilized – is superior or inferior.

Each of these two groups includes four variants depending on the design of the initial incision (order of alternating convex and concave curves) and of the resection-flap resection (operating piece)

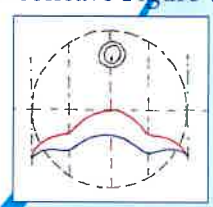
Antero-superior tri-curves BAL

The name of the flaps is defined by the downwards orientation of the curves of the superior incision line (initial incision). The resection is at the expense of the lower hemisphere in its anterior half. The top flap is mobilized down if necessary. Based on the curves alternation we distinguish four types of Antero-superior tri-curves BAL:

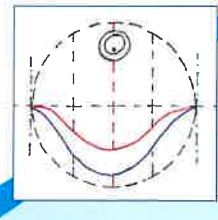
a) tri-convex Figure 9



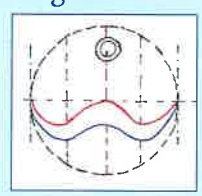
b) tri-concave Figure 10



c) convex biconcave Figure 11



d) concave biconvex Figure 12

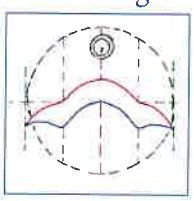


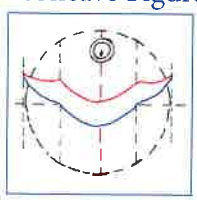
Postero-inferior tri-curves BAL

Here the name of the curvatures as convex and concave is defined by their upward orientation. The initial incision of the hydrocele, winding, three-time curve, extends on the upper half of the scrotal mass near the equator line or straddling at its ends, on the anterolateral sides, from a medio-lateral meridian to the other.

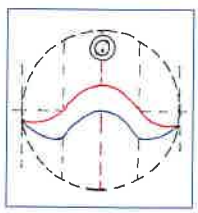
We identify four types of postero-inferior tri-curves BAL based on the alternation of concavity or convexity which are oriented upward, direction in which the flap will be mobilized:

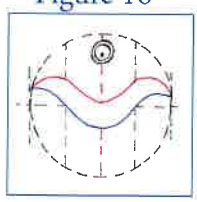
a) tri-convex Figure 13 b) tri-concave Figure 14





c) convex biconcave Figure 15 d) concave biconvex Figure 16





Resections of the Lower Polar Cap (RCPI)

These expanded scrotomectomy are resecting the entire lower pole of the two purses in one piece, with a circumferential adjacent skin surface, more or less extended in height from the lower pole of the scrotal mass, depending on the size of the excessive scrotum to be removed. The incision and contra-incision must be drawn in a plane that intersects more or less obliquely the mass, generally spherical, of the purses and not following a parallel of the sphere that perpendicularly intersects the bipolar axis.The forwards inclination of this plan determines the antero-superior flap, the largest in this case. After resection, the suture will be on the rear or more likely on the front side considering that the scrotum of the posterior face is thinner and more flexible, and therefore more easily mobilized forward and up.

The backwards inclination of this plane determines the postero-inferior flap, the largest in this case; in any case the suture is on the front of the scrotal mass.

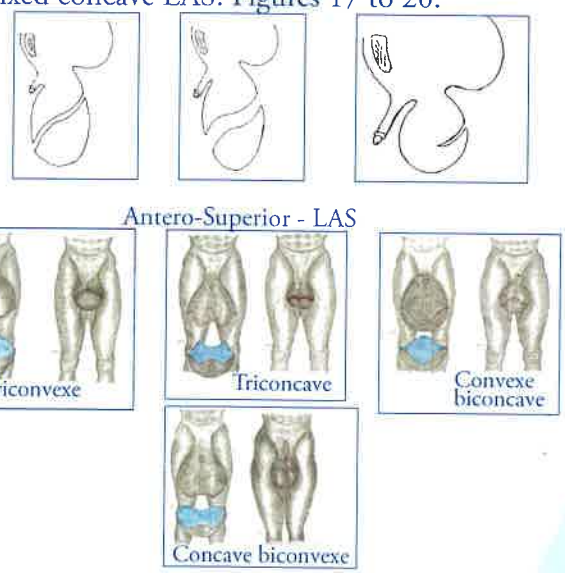
The incision line is drawing a circular winding design on all faces of the scrotal mass. It shows a pattern of alternating curves, concave up or down. The incision is located in a section plane of the sphere.

This section plane is orientated obliquely downwards and backwards.

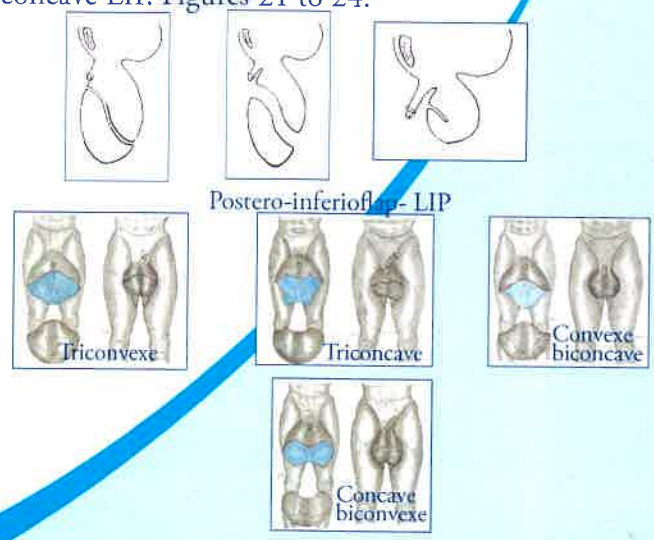
We thus identify two main groups of flaps: antero-superior and postero-inferior flaps. Here the flap refers to the portion of the scrotum which is the most expanded downward (orthostatic position) which we will bring on the other and smaller portion, for their edge-to-edge suture. These flaps are designed so that in no case the suture line is located on the neo-pole of the purses.

Each of these two major groups includes four types of flaps. This is to be able to deal with all possible anatomical varieties of hydrocele by shape, condition of the scrotum and (as for unilateralplasty) degree of burial of the penis.

• The Antero-Superior flaps (LAS) include: a) tri-convexe LAS b) tri-concave LAS c) convex biconcave or mixed convex LAS d) concave biconvex or mixed concave LAS. Figures 17 to 20.



• The Postero-Inferior flaps (LIP) include: a) tri-convexe LIP b) tri-concave LIP c) convex biconcave or mixed convex LIP d) concave biconvex or mixed concave LIP. Figures 21 to 24.



RESULTS

All these proposed techniques of resection-plasty of the scrotum were used. The results published relate only to a series of 50 resection-plasty recently performed in the continuity by the same team and the same surgeon, out of a series of 117 patients with 148 hydrocele, simple or complicated by hematoceles or chyloceles. Some techniques are not included in these results, as they were not used in this series and because they are less used. However, the variety allows the surgeon to cope with all scenarios. Results and indications have been discussed elsewhere.

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