

SURGICAL TREATMENT IN LEGG CALVE PERTHES DISEASE

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Abstract

Surgical treatment aimed at achieving or maintaining femoral head contention and offers the advantage of early mobilization by avoiding long orthopedic treatment. Content surgery can be achieved by addressing either femoral and acetabulum or both.

Key words: surgical treatment, advantage, procedures, results.

In a century since the first description Legg Calve Perthes disease is still mostly unknown and probably that is why the methods of treatment have not always the best results.

Surgical methods of treatment aimed at achieving or maintaining contention are supported by most authors because it offers the advantage of early mobilization and avoids long treatment with orthopedic inconvenience lengthy immobilisation. Content surgery can be achieved by addressing either femoral or acetabulum or both.

Lately surgery has gained ground against orthosis, especially in risk groups and children over 6 years.

There are several possibilities: Salter osteotomy (innominate), which is acetabulum inclination (slant and down) for a better coverage of femoral head, proximal femoral varus osteotomy when femoral neck is descending for 30° for better stability of the hip, the combination of the two, other^[4].

Varus osteotomy is preferred as an early treatment, because it allows accurate centering of the femoral head into acetabulum. Derotation must be achieved only if the child has a anteversion femoral head and is performed only a few

degrees^[1,2]. Innominate Salter osteotomy is an useful treatment in Perthes disease, but recovery of postoperative hip mobility may be difficult^[7].

Pathogenic surgery was abandoned row on row. Drilling, curettage and intraepiphyseal graftings give a rather middling result. Neck femoral and 1/3 of the upper femoral physis deperiostation described by Judet has been completely abandoned and even contraindicated. It was demonstrated that this intervention will only lead to a subperiostic hematoma that will make difficult blood circulation to the femoral head, with serious repercussions on the process of reconstruction^[4].

Surgery which are effect in LCP disease are recentering operations. This principle derives from surgical Salter's concept and make the surgery to have two objectives, to protect fragile areas of necrosis for mechanical aggression (pressure) and to introduce the femoral head into acetabulum so as to areas of hypertrophy be perfectly molded in acetabulum. These interventions make a reorientation of femoral head or a reorientation of acetabulum or both. In addition it appears that these interventions (osteotomies) have a trophic effect, accelerating the femoral head repair^[1,2,4].

A) Femoral osteotomies are the oldest procedures and consists in making a *simple osteotomy and sometimes associating varus and derotation*. Is performed sub or intertrochanteric (fig. 1) and offers the advantage of positioning the femoral head deep into acetabulum, protect it by the pressure exerted on the edge acetabulum forces and reducing pressure joints^[1,5].

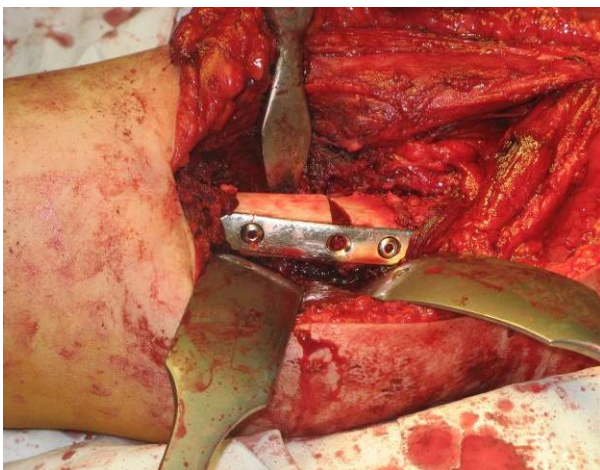


Fig. 1. Subtrochanteric osteotomy.

The objectives are restoring motility, matching between the femoral head and acetabulum and contention the head into acetabulum in abduction and internal rotation.

Osteotomy should be done preferably in the initial stage of fragmentation, trying prevention femoral head deformation by removing the pressures exerted on it (fig. 2).



Fig. 2. Fragmentation of the femoral head.

Of course, there are drawbacks of this procedure to be taken into consideration: varus osteotomy associated or not with derotation usually requires internal fixation and immobilization for 6 weeks, then at least one surgery with risks and costs for removing internal fixation and lower member is temporarily shortened by this procedure. Varus angle result should not be less than 110° because is known that it is decreasing with grow up. If an impaired cartilage growth is associate, the potential of remodeling can be decreased up to complete loss, and patient will remain with permanent shortening and limiting abduction, temporary or permanent [8]. Varus osteotomy supporters, with or without derotation reported satisfactory results in 70-90% of cases, and that argument also seems to shorten the treatment period to approximately 6 months from orthopedic treatment [6].

B) Acetabulum osteotomies

Innominate osteotomy (Salter) is performed to obtain contention by redirecting acetabulum and achieving a better coverage of anterolateral femoral head (fig. 3). It is placed in the flexion, abduction and internal rotation in trying to correct possible shortening during disease development. The objectives of this osteotomy consist in restoring complete hip motility, obtaining a round femoral head and its matching joint. Treatment should be performed early, and femoral head should be well positioned to flexion, abduction and internal rotation. Any residual adductors contracture is resolved by tenotomy. Osteotomy is stabilized by 2 or 3 wires and immobilization is maintained 6 weeks [7].

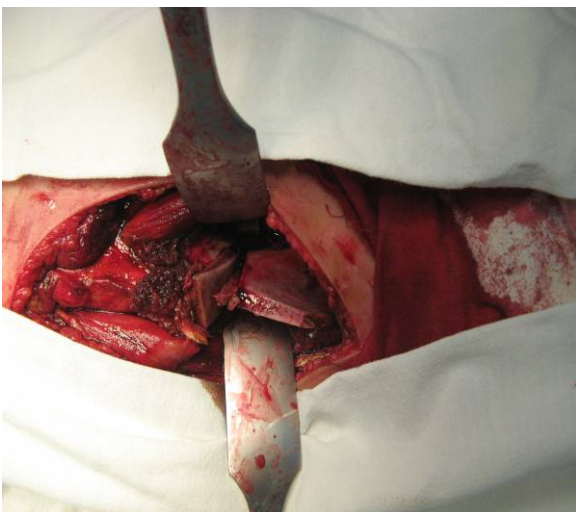


Fig. 3. Innominate osteotomy (Salter).

Disadvantages of this osteotomy consist in surgical risks, costs, need a second intervention for wires extraction. Also worthy consideration of that intervention is done the fact that operation is made on a bone previously unaffected and while this method can increase the forces acting on the femoral head by acetabulum lateralization and increased leverage abductors. Acetabulum may remain deformed, leading to loss of motility, particularly flex limitation. Anatomical satisfactory results however appears in 69-94% cases^[8].

Salter osteotomy produces an elongation effect by 0.5-1cm. which may compensate an consequent unequal leg length by disease. It appears that trophic effect achieved by this intervention is more versatile than femoral osteotomy, and authorization is walking early after Salter osteotomy, being allowed three months after intervention^[7].

Varus osteotomy associated with innominate osteotomy

Some short-term results of combination by the two procedures have been reported in patients with serious femoral head damage (Catterall 3 and 4). This combined procedure has the advantage of theoretically maximize contention femoral head and avoid complications arising in proceedings conducted separately. Femoral osteotomy directs femoral head into acetabulum while reducing the pressure on the femoral head which commonly appear after innominate osteotomy^[1,2]. Coverage achieved by the acetabulum osteotomy reduce the necessary degree for correction the femoral osteotomy and consequent minimizing complications such an excessive varus associate with abductors weakness and shortening^[7]. The sustainers of this process argue that the combined solution is surgical visa radical, definitive, allow early loading and shortens the duration of treatment. Disadvantages not exceed those of each process taken separately. At the same time, duration of the intervention is greater, potential for bleeding is increased and technically combined process is more difficult. They reported satisfactory results in 78% of patients and short term follow-up has been excellent^[8].

Shelf arthroplasty augmentation

This method was recently proposed as a first solution for children over 8 years in Catterall stages 2,3,4 with or without signs of head at risk, Herring type B or C, Salter Thompson B. Contraindications are other categories and hinge abduction. The authors suggested that this type of arthroplasty improves the anterolateral femoral head coverage and prevent subluxation and excessive epiphyseal lateral growth^[3]. Risk factors for adverse outcomes are age over 11 years, female sex, stage 4 Catterall^[8].

Triple osteotomy

The most recent time, there is no long-term studies, but in terms of this theory it can provide a good coverage of femoral head and architectural changes of the joint much more important. This intervention allows in each sector (varization, derotation and flexion) a maximum 30°

reorientation which provide the better femoral head containment in almost all forms of disease described.

Cheilectomy removed the anterolateral fragment of femoral head that acetabulum pressing during abduction. Process is addressed only to patients who have a big limitation of motility due to this phenomenon and must performed only after growth has ended to avoid further epiphyseal dislocation^[8].

In patients who prematurely closes growth cartilage, usually occur the great trochanter increase with painful gait and Trendelenburg limp and in these patients may come to question the *distal and lateral surgical great trochanter advancement*^[7].

Chiari osteotomy improve lateral femoral head coverage being useful in poor head coverage, even when starts early symptoms of degenerative arthritis^[7].

A major advantage of surgical treatment is that the final results are known, while in orthopedic treatment surgeon must decide when to interrupt treatment. Another advantage is the resumption of normal activity quickly after surgery^[8].

Disadvantages are the need to extract implants (pines or wires usually), the risk of infection and anesthesia. It is indicated to make arthrography, CT-3D or MRI before any surgery to assess acetabular cartilage contour and the femoral head, and its matching with acetabulum^[6,7,8].

If used correctly both treatment, orthopedic and surgery, have the same end results. Surgery is indicated particularly when the prognosis suggests a prolonged period of healing (big child with severe involvement of the femoral head). Because in the group I and II Catterall it is not a real deformation (only in rare cases of hip subluxation), surgical intervention is taken into account only for group III and IV Catterall. The geographical and social influence, largely for surgical indications. In some areas orthosis suitable for abduction may not be available, also may be that children and their families do not have a proper attitude to follow a treatment program with orthopedic methods. On the other hand, the surgical procedure should not be used if the patient can not be properly followed and reevaluated for potential complications^[4].

It is crucial to observe lower limbs inequality, especially if involving growth cartilage, or in they who were performed varus osteotomy. If the difference in length is significant, inequality is compensated with orthopedic shoes and the optimal age of the skeleton will be perform *contralateral distal femoral epiphysiodesis* to equalize the two legs, or if the length exceeds 4 cm femoral affected elongation by external fixation^[4,8].

The reconstruction procedures are used late in Perthes disease, to correct an preexisting femoral head deformity^[4].

In conclusion, although it tries to perform better correlations between risk factors, classifications, imaging, etc in attempt to achieve a good reflection in prognosis, yet is no unanimity in regarding Perthes disease treatment.

Surgical treatment attempt to shorten the disease evolution and improve prognosis, but significant studies on large lots

of patients and during long time are lack for the moment.

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