FEMORAL OSTEOTOMY IN TREATMENT OF OSTEO-ARTHRITIS OF THE HIP*

BY

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Osteo-arthritis of the hip has been the subject of many discussions recorded in surgical literature. It engaged the attention of the Orthopaedic Section of the British Medical Association at the meetings in 1932 and 1933, and it is once more included in the programme. It is receiving so much prominence because it is, to the patient, a very distressing condition, and, to the surgeon, a subject about the treatment of which divergencies of opinion exist.

The most recent papers by British surgeons are those of Max Page,¹ Rowley Bristow,² and T. P. McMurray,³ who have all collected results of treatment, and deal chiefly with advanced cases, stating definite conclusions. Max Page considers that, for the monarticular type, arthrodesis is the operation of choice, but if both hips are involved, or if the lumbar spine is stiff and the seat of arthritis, a remodelling operation should be chosen.

FIG. 1.—Showing position of pelvis when weight is carried by right leg.

In the sixty-nine cases he reports in which a fixed joint was aimed at this was obtained only in forty-six cases. Rowley Bristow agrees that, for the monarticular type an arthrodesis should be performed, using arthroplasties for bilateral cases and for cases in which the knee is stiff as well as the hip. McMurray reports that in a series of cases of monarticular arthritis he has performed a Lorenz bifurcation operation. He states that in twelve out of fifteen cases the results were very satisfactory.

For the advanced monarticular case which has reached the stage when it is felt that rest and physiotherapeutic and other non-operative measures have proved ineffective or are contraindicated we have, therefore, Max Page and Rowley Bristow advocating an arthrodesis, but McMurray recommending the Lorenz bifurcation operation.

It is my object to report a short series of advanced cases in which a simple femoral osteotomy has been performed and proved effective. This operation is mentioned by both Page and Bristow, and was advised for certain cases by the president of this Section, Professor Hey Groves,⁴ in his paper at the British Medical Association Centenary Meeting in 1932.

* Read in opening a discussion in the Section of Orthopaedics at the Annual Meeting of the British Medical Association, Melbourne, 1935.

The Single Arthritic Hip

The problem of the single arthritic hip is primarily one of pain. Patients come for advice usually not because of deformity but because of pain, and it is therefore of the first importance in treating the condition to know as far as possible exactly how and why the pain occurs. Max Page thinks that the pain most in evidence in the early stages of the disease may be due to irritation of the nerves underlying the articular cartilage, and that this passes off when the articular cartilage has become completely eroded and the underlying bone sclerosed. This seems to agree with clinical experience.

If this is so, this pain may be excluded or at least regarded as of less importance in considering the later cases. Elmslie,⁵ in reviewing the aetiology of the condition, summarizes his conclusions by saying that the factors concerned in the production of the condition may be classified as traumatic, mechanical, toxic, and local disease of the articular ends of the bone. He states that when once the degenerative changes have started alterations occur, entering into the articulation, so that whatever the original cause an additional mechanical factor is thus induced. Whatever the cause of the condition in the first instance—and it will be agreed that in most cases

FIG. 2.—Showing position when weight is borne on adducted hip.

there is either a traumatic basis or that traumata are superadded—there is no doubt that the final result is a disparity between the two bony components of the joint. As a consequence, faulty mechanics induce a strain mostly taken by the inelastic fibrous structures surrounding the joint, and result in producing muscular spasm, which increases and maintains the deformed position. It will be accepted that in patients who seek advice on account of pain, in practically all advanced cases deformity of the affected hip is present, the three most marked deformities being adduction, external rotation, and flexion. In some the adduction, in some the flexion, and in some the external rotation is the most prominent. It is to the cases in which deformity, more or less marked, is present that my observations chiefly refer.

What happens to the normal hip in walking? As the leg is carried forward in taking a step the hip is first flexed, adducted, and externally rotated and extended. The longer the step the more these movements are intensified. At the time when the leg is carrying the maximum weight it is abducted and slightly internally rotated. It follows, therefore, that a hip which will not abduct and is held externally rotated must be strained at each step, and that the strain must be borne by structures not designed for the purpose. That this contention is correct is generally admitted, and it is supported

by radiographs which, in many cases, show clearly that it is impossible, on account of deformity, for the bones to make the normal movements of walking, and that they can take, therefore, only a proportion of the body weight, the remainder of which must be borne by the edge of the acetabulum and the capsule, and the muscles surrounding it. Indeed, without the support of this capsule and of the muscles subluxation of the hip would occur. This must cause pain—a pain which is largely a question of faulty mechanism.

Now it is quite clear that, if any joint is arthrodesed in a good functional position, pain in that joint will be eliminated, but only by sacrificing any movement which is present and by calling on adjacent joints to make more than their normal movements. This, in fact, is what happens when a hip is arthrodesed.

Simple Trochanteric Osteotomy

Now an apparently useful range of movement, if in the wrong position or plane, may be useless or indeed a

FIG. 3.—Correction of alignment by means of an osteotomy.

source of weakness. But it is in accordance with sound orthopaedic principles to correct faulty mechanics and if possible to utilize this movement by altering its plane. I think that in some cases of the specified type of mono-articular arthritis of the hip this can be done by the use of a simple trochanteric osteotomy. In the presence of a fibrous ankylosis the operation is of equal value as the cause of pain in these cases also is largely a matter of faulty mechanics. By means of the osteotomy the thigh can be abducted and, if necessary, internally rotated and the hip realigned, thus enabling the acetabulum and the head of the femur to take the body weight in a normal way.

The operation is simple. Through a six-inch incision on the outer side of the thigh, beginning at the level of the great trochanter, the femur is divided at the level of, or just below, the small trochanter. If the main deformity is adduction, the bone is divided in a plane slightly oblique from without, downwards and inwards. If necessary the adductors are tenotomized. The limb is then placed in the abducted position. When the main deformity is external rotation, the division of the bone is transverse with no obliquity, the shaft being then rotated the required amount. After the bone has been inspected and it is seen to be in the correct position, the wound is closed and the patient placed on a Jones abduction frame. Radiographs are taken the following day, and the position adjusted if necessary. If union is taking place satisfactorily after eight weeks a long plaster spica is applied

and the patient allowed to walk. This spica is retained for three or four months. In some cases a plaster spica is used from the commencement.

Results of Operation

In the Harlow Wood Orthopaedic Hospital this operation has been performed fourteen times during the last few years without any mortality and practically without any appreciable operative or post-operative anxiety. Two of the patients died several months later on account of other conditions, and are therefore not included in the table which has been prepared. The results so far have been satisfactory. In all there has been a reduction and in most cases entire elimination of pain, though four of the cases have not been done long enough to assess the real value of the operation. The first eight patients have all returned to work, and some of them to laborious occupations.

Femoral Osteotomy for Osteo-arthritis of Hip. Analysis of Cases

Sex	Age	Hip	Deformity	Date of Operation	Result
F	39	R.	25° Adduction, 60° Flexion	4/2/32	Walking well. Occasional pain. Full work
F	48	R.	40° Flexion, 15° Adduction, 20° External rotation	25/2/32	Occasional pain, but does full work at hosiery factory
F	65	R.	Flexion and adduction	23/3/33	Walking well. No pain
M	58	L.	45° Flexion, 1 in. Shortening	17/10/33	Walking well. No pain. Full work
M	57	L.	50° Adduction	9/1/34	Walking well. No pain
M	60	R. & L., operation on L.	20° External rotation (L.)	18/6/34	Walking well. No pain
M	64	R.	External rotation	21/6/34	Walking well. No pain
M	52	R.	50° Flexion, 30° External rotation	19/7/34	Walking well. No pain. Full work
F	58	R.	Adduction, 45° Flexion, 3/4 in. Apparent shortening	11/10/34	Walking fairly well with stick. (Had not walked for 3 years)
F	46	R.	75° Flexion	13/11/34	Too early to give result. Not seen since removal of plaster
F	33	R.	30° Flexion, 45° External rotation	11/12/34	Too early to give final result. Walking well. No pain
F	58	R.	45° External rotation	20/12/34	Too early to give final result. Walking well. No pain

I know that my series is too small and the period of observation too short definitely to determine the permanent value of the operation. It is, however, now more than three and a half years since the operation on the first two cases, and they still seem quite satisfactory. It is true that they have had occasional pain, but this I attribute to the spine and not to the hip. They are doing full work.

Conclusions

1. In advanced cases of mono-articular osteo-arthritis of certain types pain is largely a matter of faulty mechanics.
2. By correcting the deformity and realigning the femur the mechanical strain on the joint and pain may be eliminated.
3. The simplest method of achieving this, and the method with least operative risk, is the femoral osteotomy. This will preserve any useful movement which is present in the joint.

The subject has been brought forward because it is felt that the operation described, though not new, has rather been neglected in the past. It is a useful addition to the methods generally advocated, and may, indeed, in certain cases, with advantage be used in their place.

REFERENCES

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- ² Bristow, W. R.: *Ann. of Surg.*, 1934, c, 1043.
- ³ McMurray, T. P.: *Brit. Journ. Surg.*, 1935, cxxii, 88.
- ⁴ Hey Groves, E. W.: *British Medical Journal*, 1933, i, 3.
- ⁵ Elmslie, R. C.: *Ibid.*, 1933, i, 1.