COMPLICATIONS AND DIFFICULTIES OF THE JUDET ARTHROPLASTY

ST J. D. BUXTON and W. WAUGH, LONDON, ENGLAND

From the Department of Orthopaedic Surgery, King’s College Hospital, London

As far as we are aware arthroplasty of the Judet type was not performed in this country until 1950 and the first case was recorded in that year (King’s College Hospital Gazette 1950). Most surgeons are agreed that this operation is a welcome advance in the surgery of the hip and that it may herald progress in the treatment of other stiff and painful joints. The experience of the Judet brothers is considerable and they have expounded the advantages of this form of arthroplasty (1950) and in a recent review (1952) of 400 patients the morbidity and complications were described. MacAusland (1951) was first to record the operation in America, but in his series of thirty-one cases there is no mention of any complications.

It is considered too early to assess the long-term value of the operation. The main object of this paper is to report measures adopted to prevent complications and discuss some of the difficulties of the operation and of the post-operative treatment. In a series of 100 operations, the following complications have occurred. Haematoma, 2*; dislocation, 5; new bone formation, 2; fracture of the stem, 2; deep vein thrombosis, 3. There was no case of deep wound infection. The series is unselected and represents the work of three surgeons and the operations were done in six different hospitals. The only patient no longer alive was a man of seventy-eight, who weighed 16 stone and who suffered from diabetes mellitus. He fractured the neck of his femur and died six months after replacement of the fractured head by a prosthesis.

Prophylactic measures—Great stress is laid on the prevention of operative shock. Gentleness, control of haemorrhage and skilful anaesthesia are important. Blood transfusion is given as a routine immediately before and during the operation. It is not usual for any patient to need more than one pint of blood, since anaemia is corrected before operation and blood loss is not great.

Chest complications are rare, and have usually taken the form of an exacerbation of chronic bronchitis. Advances in anaesthesia (which has always been a combination of the intravenous and inhalation types) have been instrumental in avoiding these complications. Breathing exercises before and after operation, and the routine use of systemic penicillin are measures of importance.

Deep vein thrombosis has occurred in three cases—a low incidence in view of the average age of the patients (fifty-four years), the site and magnitude of the operation and the post-operative immobilisation. It is feared that thrombosis may occur with equal frequency in the operated and normal limb and it is a sound measure to prevent pressure on the calf of the normal limb by placing sorbo cushions beneath it during the operation. Limb movements are encouraged immediately after operation. When thrombosis has occurred treatment with anticoagulants is begun promptly. In only one case has physiotherapy been held up for more than a few days. In this case, that of a man of sixty-five with osteoarthritis of both hips, operation was followed by deep vein thrombosis in the calf on the side of the operation and a small pulmonary embolus. A large haematoma formed in the anterior part of the thigh, possibly from the use of heparin. Treatment for the hip was delayed for several weeks and, at the time of his discharge, movements were limited.

* This figure represents only cases of large haematoma in which the clot has had to be evacuated surgically or has discharged spontaneously.
The importance of prophylactic measures is emphasised because most patients are elderly and are liable to suffer from the complications mentioned. Any local disturbance in the wound—sepsis, haematoma or delay in healing—may increase the severity of a systemic complication. Similarly the presence of general complications may be a factor in delayed wound healing.

**Selection of patients**—The development of a satisfactory technique by which complications are minimised has greatly widened the field for this operation. Very few patients are unsuitable by reason of age provided all members of the team are conversant with the pre-operative, operative and post-operative procedures. Senility, implying an inability for reasonably intelligent co-operation on the patient's part, is a contra-indication for this as for any other major reconstructive surgery.

**LOCAL COMPLICATIONS**

**Haematoma**—This may take the form either of a diffuse infiltration of the tissues or a local collection of blood. The former is recognised by oedema and thickening below the wound and in the buttock. It occurs commonly and may persist for as long as two months. It is a nuisance because it may delay the return of movement, but it is not serious. Careful haemostasis, the application of elastic adhesive bandages to support the outer part of the wound, a sandbag placed against the upper part of the thigh, or a spica of flannel bandage limit its severity. A localised haematoma has twice caused concern: in one patient (already quoted) the fluctuant area was incised and resutured; in the other the blood discharged spontaneously and infection was avoided.

In most operations an antero-lateral approach has been used and occasionally bleeding from the muscles separated from the lateral surface of the ilium has been troublesome. With care, however, this can be controlled and we do not consider that any other approach gives less trouble in this respect.

**Wound infection**—The avoidance of serious wound infection in this series may be partly explained by the routine use of antibiotics. It is considered that the easy approach, with limited dissection into muscle planes, and the shortness of operating time are important in reducing the possibility of sepsis. Superficial infection has occurred in a few cases, but in only one has healing been delayed beyond three weeks. On no occasion has deep infection occurred nor has it been necessary to remove a prosthesis for this reason. This is in contrast to figures reported for vitallium-cup arthroplasty. In Law's (1948) review of 182 of Smith-Petersen's cases superficial sepsis occurred in eight and deep sepsis in nine. Bickel and Babb (1948) reported ten cases of wound infection in 274 operations and the cup had to be removed in five. Gibson (1949) had to remove one cup in 100 cases because of sepsis.

**Dislocation**—Dislocation of the plastic head out of the acetabulum should be avoidable and the study of the five cases illustrates certain important features.

If the reconstruction restores nearly normal anatomical relationships, the new joint will be stable provided the limb is held in flexion, abduction and medial rotation, as can be demonstrated on the operating table before the wound is closed. Stability is due to two factors. First, the joint is a ball and socket which is, in itself, mechanically stable; and second, in the position of stability muscle pull helps to force the head into the acetabulum. In the course of healing, a strong fibrous pseudocapsule forms and this plays an important part but one which is secondary to the factors already mentioned.

When dislocation occurs the limb commonly rolls out by its own weight and the head comes forwards out of the acetabulum. Alternatively, with adduction of the limb the head rides upwards over the upper lip of the acetabulum. Minor degrees of this latter type of subluxation are occasionally seen: radiographs taken with the limb in abduction show the head in the acetabulum, but in adduction it lies just below the upper lip. This is not necessarily associated with instability and the result may be satisfactory. In practice, complete
dislocation results from a combination of lateral rotation and adduction (with one often predominating over the other) and is incompatible with good function.

The main features that may predispose to dislocation are mechanical and can be anticipated before operation. First in importance is the length of the femoral neck. When this is short—as in old subcapital fractures and in osteoarthritis with "mushrooming" of the head—reconstruction with the Judet prosthesis may result in an unstable joint. Lengthening of the neck by transposition of the greater trochanter is a recognised procedure but is seldom satisfactory. The use of a prosthesis with a neck attached may provide a solution to this problem, but as yet the method is still sub judice. Second, dislocation will tend to occur when the acetabulum is shallow and has a sloping roof. This is by no means so difficult a proposition as the short neck and it can usually be dealt with satisfactorily by extensive reaming with the Smith-Petersen instruments. Judet's reamer is not adequate for shaping the acetabulum and should be reserved for removing soft tissue. In cases of congenital dislocation reaming of the acetabulum may not be sufficient to give stability and it may be necessary to construct an upper lip (D'Aubigné 1962). A third mechanical factor can be the result of a technical error during the operation. If the prosthesis is inserted in an exaggerated valgus position, dislocation will occur more readily during adduction. A few degrees of valgus are probably helpful because with weight bearing the strain will be taken down the length of the prosthesis rather than across it, but the greatest stability is achieved when the stem is inserted exactly down the middle of the neck and parallel with its edges.

During operation care should be taken to avoid the muscle damage which may follow an unnecessarily wide exposure or vigorous retraction. If this occurs delay in recovery of muscle tone may be a secondary factor contributing towards dislocation. The straight head of the rectus femoris muscle should be preserved and stripping of the iliac crest should be limited to a distance of two or three inches. In most cases the capsule has been excised widely, leaving only a strip one inch wide posteriorly. Although repair of the capsule may be desirable theoretically in this operation it is difficult technically, even in recent fractures. Furthermore it is still generally held that capsulectomy is advisable if pain is to be relieved. At the end of the operation and before the wound is closed it is helpful to assess the range of movement and the stability of the joint. If dislocation occurs readily after a few degrees of lateral rotation or adduction special care will be needed during the post-operative treatment.

Dislocation may occur soon after operation from failure to maintain the position of stability. The limb should be carefully held by an assistant at the end of the operation and while the patient is being returned to the ward. When he is back in bed skin or skeletal traction is set up. If strapping is used it is important to apply a cross-piece at the level of the knee to control rotation. The limb is suspended in slings or, if a tibial pin is used, in a Tulloch Brown splint. Weights or springs are used to maintain the required position.

Exercises for the sound limb and for the knee, ankle and toes on the side of the operation are begun straight away, but hip movement—apart from that which takes place during sitting and lying—is not actively encouraged for two weeks. In the early stages more attention should be paid to the maintenance of muscle tone by static contractions rather than to regaining the range of movement: this is usually restored easily. It is possible that too early or too vigorous activity might result in dislocation. Traction is maintained for from three to six weeks, after which the patient is allowed out of bed. Weight bearing is begun five to seven weeks after operation in the average case: at first with crutches and as soon as possible with sticks. Dislocation is unlikely to occur after the fifth week, although in one case it was first noticed in the seventh week (Case 2).

In general, then, it is fair to conclude that mechanical factors such as shortness of the neck, shallowness of the acetabulum and the insertion of the prosthesis in an excessively valgus position are the prime causes of dislocation. Excision of the capsule and delay in recovery of muscle tone probably play only a secondary part.
The diagnosis of dislocation is not difficult. The patient complains of pain in the hip, but is not aware that dislocation has occurred. In none of our cases has dislocation been observed to follow any sudden movement or change in position. Hip movements are limited and the leg is rolled out. There is a characteristic alteration in the shape of the thigh, but bony landmarks are difficult to feel because of thickening around the joint. Diagnosis is confirmed by radiography. Treatment should not be delayed: the dislocation is reduced as soon as possible, under a general anaesthetic, by traction, abduction and medial rotation. The resilience of the soft parts at this stage of repair makes it difficult to be sure if reduction has occurred after manipulation and it is not possible to feel a "click" as the head enters the acetabulum. Reduction is confirmed radiographically. In our five cases reduction was achieved without difficulty. The problem of maintaining reduction is, however, not so easy. Rotation must be controlled and a long hip spica is probably the most satisfactory method. Other methods consist of holding both legs in wide abduction with skin traction or with short plasters and a cross bar. Immobilisation for three or four weeks should be enough to ensure stability, but once complete dislocation has occurred the mechanical factors that caused it persist and there will be a tendency to recurrence. The practical difficulties are discussed in the five case reports given below.

**Case 1**—Woman aged fifty-eight. Subcapital fracture of the right femur. A Smith-Petersen nail was inserted two weeks after injury, but the fracture failed to unite and radiographs showed absorption of the neck and extrusion of the nail. At operation the neck was found to be short and part of the greater trochanter had to be removed before the plastic head could be fitted. Five weeks after the operation she complained of pain in the hip and the plastic head was found to be dislocated. It was reduced and the position was maintained by skin traction. Two weeks later dislocation recurred. It was again reduced and a hip spica was applied. After a further four weeks radiographs again showed redislocation. The original operation wound was reopened and the instability of the joint was easily demonstrated. The plastic head remained securely fixed on the femur. The acetabulum was enlarged and the greater trochanter detached and transferred one inch down the shaft of the femur, being refixed with a screw. Reduction now appeared stable, but three and a half weeks later radiographs showed that dislocation had once more recurred. No further attempts at reduction were considered. When discharged she was walking well with a caliper which she has since been able to give up.

*Comment*—This case illustrates the difficulties of maintaining stability when the femoral neck is short. An attempt to remedy this by transplantation of the greater trochanter failed. In this case the large stature and heavy build of the patient added to the difficulties of treatment.

**Case 2**—Man aged forty-three, suffering from dysplasia epiphysialis multiplex. Both hip joints were affected and he developed a painful secondary osteoarthritis on the left side (Fig. 1). At operation extensive removal of the capsule was carried out: the acetabulum was not touched. The plastic head seemed stable while the patient was on the operating table. Seven weeks after operation, after he had been walking with crutches for two weeks, it was found that the plastic head had subluxated (Fig. 2). The date when the subluxation occurred is unknown, but ten days before he had complained of some pain in the hip. The subluxation was reduced under a general anaesthetic and the joint was stable in abduction and medial rotation. This position was held by two below-knee plasters and a cross bar. Two weeks later a single hip spica was applied, reduction still being maintained (Fig. 3). He was allowed to walk in this plaster, which was removed seven weeks after the subluxation was reduced. Subsequently he walked with crutches and the subluxation did not recur.

*Comment*—In this case the abnormal shape of the acetabulum and the shortness of the neck were basic factors in causing dislocation. The displacement was not so complete as in Case 1 and reduction is still maintained. It is likely that a minor degree of subluxation occurred before the diagnosis was made and produced symptoms only on weight bearing.

**Case 3**—Man aged seventy-two. Chronic non-specific inflammatory arthritis with avascular necrosis of the femoral head, of unknown etiology (Fig. 4). At operation the capsule of the hip joint was grossly distended with fluid and the synovial membrane was polypoid. The head was removed and a plastic prosthesis fitted (Fig. 5). After operation he was extremely ill, developing uraemia, broncho-pneumonia and a deep vein thrombosis of the right calf. His condition slowly improved. Three weeks after operation the large effusion had re-formed and the plastic head
FIG. 1
Case 2—Before operation. Osteoarthritic changes in the left hip secondary to dysplasia epiphysialis multiplex. The acetabulum is shallow.

FIG. 2
Case 2. Figure 2—Six weeks after operation, showing subluxation of the plastic head. The stump of femoral neck is very short. Figure 3—After manipulative reduction the hip remained stable.
Case 3—Before operation. Avascular necrosis of the right femoral head of unknown etiology.

Case 3. Figure 5—After operation. The neck is of adequate length. Figure 6—Three weeks later. Complete dislocation of the plastic head. The shallow acetabulum and rapid collection of fluid were the contributing factors. Note the extreme lateral rotation.
Case 4—Before operation. Avascular necrosis of the left femoral head following a subcapital fracture. Note track of Smith-Petersen nail.

Case 4. Figure 8—After operation. The short neck and exaggerated valgus position of the prosthesis are well shown. Figure 9—Two weeks later. Dislocation has occurred.
had dislocated (Fig. 6). Reduction was accomplished easily and the limb was held in a short hip spica. At the same time 60 cubic centimetres of blood-stained fluid was aspirated from the hip joint. Eleven days later dislocation recurring while the limb was still in plaster. He was a feeble old man and no further operative treatment was considered. A caliper was ordered. Ten weeks after operation he developed a right-sided hemiplegia from cerebral thrombosis.

Comment—In this case the neck was of sufficient length but the acetabulum shallow. Rapid distension of the hip joint with fluid and difficulty in post-operative care, because of his poor general health, were factors leading to dislocation. Figures 2 and 6 illustrate the two types of dislocation, one occurring in adduction and the other in lateral rotation.

Case 4—Woman aged fifty-seven. Subcapital fracture of the left femur treated initially by Smith-Petersen nail. The hip became painful and the nail was removed. Pain and disability increased and movements became restricted to 10 degrees of flexion. Radiographs showed avascular necrosis of the femoral head (Fig. 7). Prosthetic replacement of the femoral head was undertaken. Post-operative radiographs showed a valgus insertion of the prosthesis (Fig. 8). Three weeks later the plastic head was found to be dislocated (Fig. 9). Reduction was easy; the position was maintained with plaster boots and a cross bar. After three weeks the head was still in the acetabulum and the fixation was removed. One week later dislocation recurred. No further attempt at reduction was made and at a second operation the plastic head was removed and the neck of the femur trimmed leaving an “excision” type of pseudarthrosis.

Comment—In this case the femoral neck was rather short, but the valgus insertion of the prosthesis was probably the deciding factor in producing the dislocation.

Case 5—Man aged sixty-eight years. Ununited fracture of neck of left femur. At operation the femoral head was replaced by a prosthesis. Post-operative progress seemed satisfactory; ten days later radiographs showed that the plastic head had dislocated. Reduction was accomplished and maintained by skin traction with both legs in wide abduction. There has been no recurrence.

Comment—A short femoral neck was again a factor in producing the dislocation, but its early occurrence was precipitated by difficulties in controlling the position of the leg after operation.

Discussion—The incidence of dislocation in this series is 5 per cent. Although it has been dealt with at length it is not confined to the Judet type of operation. It occurs also after cup arthroplasty, when it presents an equally difficult problem. In Law’s (1948) series dislocation was reported in 3-3 per cent of cases; in Gibson’s (1949) in 3 per cent, and in Bickel and Babb’s (1948) in 1-1 per cent. No detailed references to the instances of complications of the Judets’ type of operation have been discussed in the literature except in papers by Thomson (1952) and Judet and Judet (1952). Thomson used a “light bulb” type of plastic head fixed to a Smith-Petersen nail. In twelve cases he noted that the only troublesome complication was dislocation, which occurred three times. In two of these cases the patients were hemiplegics with adductor spasm. In the third of these cases the prosthesis subluxated towards the upper edge of the acetabulum but the patient walks with a stable hip. This incidence is higher than need ordinarily be expected. It is clear that every effort must be made to prevent dislocation, and measures which are found to be helpful before, during and after operation have been discussed. When dislocation does occur, reduction should be attempted, but it is emphasised that the mechanical factors causing it will still be present and so permanent stability is difficult to achieve. It can be maintained when there has been only a small degree of subluxation or when dislocation has resulted from some difficulty during the immediate post-operative period, the reconstruction being mechanically satisfactory. Otherwise the complication is serious and further attempts to stabilise the joint may not be successful.

New bone formation—In this type of operation new bone formation should be less common than with cup arthroplasty. In this series it occurred in 2 per cent of cases. Bickel and Babb reported the low incidence of 1-4 per cent. In Law’s series, however, “hypertrophic changes” were observed in 9-3 per cent of cases. Two factors are largely responsible for the low incidence of this complication in Judet’s type of operation as opposed to cup arthroplasty. First, the
muscles are stripped from the iliac crest for only a short distance. Secondly, in the cup operation there is greater chance of bone fragments being left behind in the recesses of the wound.

**Case 6**—Man aged forty-one. Osteoarthritis of right hip (Fig. 10), for which Judet-type arthroplasty was undertaken (Fig. 11). Everything was straightforward until three months after operation, when he complained of discomfort in the hip and noticed that it was becoming stiff. The range of flexion had decreased from 80 degrees to 40 degrees and no other movement was present. Radiographs showed that new bone had formed between the greater trochanter and the upper lip of the acetabulum. All treatment was stopped and he was kept under observation. Four months later the new bone had consolidated completely (Fig. 12). Six months after the first operation the joint was re-explored and a large plaque of new bone was found in the gluteus minimus and in the capsule over the front of the joint. It was firmly attached to the greater trochanter and

![Fig. 10](image1.png)

**Fig. 10**
Case 6. Figure 10—Before operation. Osteoarthritis.

![Fig. 11](image2.png)

**Fig. 11**
Case 6. Figure 11—After operation.

![Fig. 12](image3.png)

**Fig. 12**
Case 6. Figure 12—Consolidated plaque of new bone six months after operation.

![Fig. 13](image4.png)

**Fig. 13**
Case 6. Figure 13—Three months after excision of new bone.
had to be removed with an osteotome. The plastic head was left in place. The limb was suspended in the usual manner but hip movements were not begun till nine weeks after operation. On discharge he was walking well with two sticks and his range of movement was increasing. There was no evidence of further new bone formation (Fig. 13).

**Case 7**—Woman aged eighty-one. Subcapital fracture of right femur treated unsuccessfully by the insertion of a Smith-Petersen nail. The femoral head was replaced by a prosthesis. Her progress was slow as she made little attempt to co-operate, but when discharged four and a half months after operation she was able to walk unaided. Radiographs at that time showed the formation of excessive new bone around the hip joint. No further treatment was considered in this case in view of her age and inability to co-operate. She was later readmitted with a fracture of a shaft of the same femur.

**Fracture of the stem**—It may be that fracture of the stem of the prosthesis is one of the disadvantages of this operation. So far, in this series with an average follow-up of ten months, it has occurred in only two cases. The fact that any material is liable to fatigue-fracture in the course of time makes it difficult to assess the importance of this complication until the operation has been carried out for ten years or more. In Judet and Judet’s original series the incidence of fracture of the stem was high, but after a metal insert was introduced into the prosthesis they claim that there have been no further fractures (Judet and Judet 1950).

In the present series there has been a metal stem in every prosthesis used.

**Case 8**—Man aged sixty-six. Osteoarthritis of right hip. Replacement of the femoral head by a prosthesis was undertaken. He was discharged three months after operation. When seen four months after the original operation he complained of having had pain in the hip during the previous week. It had not come on suddenly or been related to any injury. He was unable to take weight on the limb, and radiographs showed a fracture through the metal stem of the prosthesis (Fig. 14). The joint was re-explored. There was much fibrosis around the joint and a strong new capsule had formed. The broken plastic head was removed and a new one, with a longer stem, inserted. He made good progress and is walking without pain.

**Comment**—Figure 15 shows the plastic head after removal. The clean fracture through the stem is well illustrated. It seems likely that it was due either to a flaw in the metal or to a fatigue fracture. It is clear, in any event, that the fracture was spontaneous and not related to any injury. The following case is in contrast to this.
Case 9—Woman aged sixty. Ununited subcapital fracture of left femur with avascular necrosis. Prosthetic replacement of the femoral head was carried out (Fig. 16). She was discharged five weeks after operation with a good range of movement. Fourteen months later she tripped and fell on a staircase. The hip became painful and she could only get about with difficulty. Radiographs

![Fig. 16](image)

**Fig. 16**
Case 9. Figure 16—After operation. Figure 17—Fracture of the lower border of the femoral neck after a fall fifteen months after operation.

![Fig. 17](image)

![Fig. 18](image)

**Fig. 18**
Case 9. Figure 18—The plastic head after removal showing fragmentation of the plastic stem although the metal insert is intact. Figure 19—After insertion of a new prosthesis in a greater degree of valgus.

![Fig. 19](image)

a month later showed a fracture of the lower border of the neck of the femur and the plastic head now in a varus position (Fig. 17). The joint was re-explored. The plastic part of the prosthesis was found to be broken into several pieces, although the metal insert was intact (Fig. 18). A loose piece of bone was found to have been broken from the lower border of the neck. The plastic head and the pieces of the stem were removed. A new head was inserted in a more valgus position and
the defect in the neck packed with bone chips taken from the ilium (Fig. 19). Her progress has been satisfactory, but she was given a caliper during the early stages of weight bearing.

Comment—It is fair to suggest that this fracture was produced by a mechanism similar to that which would cause a fracture of the neck of the femur. Even if a prosthesis of metal had been used the bone might have broken and a similar condition occurred. This plastic head had been in place for fifteen months, and when it was removed a certain amount of flattening and wear could be seen on its surface. It is probable that wear occurs in all cases and its consequences after a period of years are not easy to predict.

Discussion—Experience of the treatment of this complication has not been sufficient to allow any definite statements to be made. In the two cases described the operations were carried out per securdum artem, it being felt that replacement of the broken prosthesis with a new one would be more satisfactory than converting the joint into a pseudarthrosis.

OPERATIVE DIFFICULTIES

The peculiar difficulties of this operation arise in the removal of the head and the shaping and boring of the neck of the femur.

The head is cut off through its base with an osteotome and this may be done before or after dislocation of the joint, according to personal choice. When there is strong fibrous ankylosis separation of the head while it is still in the acetabulum and subsequent removal with a corkscrew produces less disturbance. Once the head has been removed, the neck is prepared to receive the stem and collar of the plastic head. It is not difficult to choose the correct line, but if the bone is very soft, as it often is in cases of recent fracture, the neck may crumble, making a satisfactory fit impossible. Similarly in cases of osteoarthritis, cysts may be present and will result in defects of the neck. It is surprising that, unless these defects are very large, the head can be fitted firmly and a good functional result obtained. A defect in the lower border of the neck may be overcome by packing the space with bone chips, but this is not entirely satisfactory. In only one case, however, has this deficiency been insurmountable. A man of fifty-nine with gross osteoarthritis of the left hip was found at operation to have advanced cystic changes in the femoral neck. Post-operative radiographs showed the head in 90 degrees of varus and with very little bony support below it. He has been fitted with a caliper.

In another case a woman of sixty-two, with gross bilateral osteoarthritis, had a successful plastic replacement on one side. When the second side was operated on, the neck was found to be so short that it was impossible to fit a plastic head and she was left with a pseudarthrosis of the “excision” type.

It is sometimes difficult to dislocate the hip at operation. This was particularly so in one case, that of a man of sixty with osteoarthritis associated with Paget’s disease. In another case, in which there were gross hypertrophic changes following central dislocation, the head was so firmly fixed in the acetabulum that it could not be removed, after division, with a “corkscrew.” A new acetabulum was reamed out of the head itself. The functional result has been excellent.

DISCUSSION

There is little doubt that the study of these local complications has been greatly helped by having some radio-opaque markers in the prosthesis. A complete metallic head and stem is too dense and makes assessment difficult. It is hoped that in due course a plastic with a suitable radio-opaque element will be found, for at present details of fractures of the plastic can only be known at operation.

Evidence soon established that this operation was less of an ordeal for the patient and surgeon and that comfort after operation was far greater than with the other forms of hip arthroplasty. It is not intended, however, to indicate the function achieved by this operation and in due course it is hoped to publish the late results.
COMPLICATIONS AND DIFFICULTIES OF THE JUDET ARTHROPLASTY

SUMMARY

1. Complications of the Judet arthroplasty are few.
2. The antero-lateral approach provides good access to the joint for insertion of the prosthesis.
3. Details of treatment before and after operation are described and their importance in limiting complications is emphasised.
4. The complications that have been encountered—including dislocation and fracture of the stem—are described and factors in their causation are discussed.
5. Study of the mechanical state of the new joint and the diagnosis of complications are aided by radio-opaque markers in the prosthesis.

We wish to thank other members of the department for their collaboration and help in the practice and development of this type of arthroplasty, especially Mr H. L.-C. Wood and Mr R. C. F. Catterall.

REFERENCES