

ARTHRODESIS AND ARTHROPLASTY OF THE HIP JOINT

By

IVAR ALVIK

Osteoarthritis and severe posttraumatic conditions such as necrosis of the femoral head and pseudarthrosis of the neck are in most cases so disabling that surgical intervention has to be done to reduce pain and to restore physical fitness and working ability. The surgical procedures are legion ranging from excision of the femoral head (*Kocher, Girdlestone*), denervation of the joint (*Tavernier*), different types of reconstruction operations (*Whitman, Colonna*), osteotomies (*Lorenz, Pauwels, McMurrey, Brittain*), muscle release operation (*Voss, McFarland*) to arthrodesis and many different types of arthroplasties: cup-arthroplasty (*Smith-Petersen*), skin arthroplasty (*Kallio*), plastic head replacement arthroplasty (*Judet*), and various types of intramedullary replacement arthroplasty (*Thompson, Moore*).

For old and debilitant individuals with a very painful hip lesion we consider the Girdlestone operation to be of great value when arthrodesis or arthroplasty is contraindicated. We do not have any experience with osteotomies for osteoarthritis of the hip, and apart from a few cases of Girdlestone operation arthrodesis and arthroplasty have been the main surgical procedures for osteoarthritis, severe posttraumatic conditions, and congenital dislocation (adults). From 1943 till 1960 360 hip joints were operated upon in this way. In the first part of this period the main procedure was Smith-Petersen cup-arthroplasty. Later on Judet's arthroplasty and different types of intramedullary arthroplasties were used to a certain degree alternating with cup-arthroplasty and arthrodesis, and in the last part of this period arthrodesis was the usual operation. If an arthroplasty is indicated, the type used now is the cup-arthroplasty of Smith-Petersen and rather seldom the intramedullary replacement operation, and if so the Moore prosthesis is preferred.

Osteoarthritis has been the main indication for surgery (Table 1).

The age distribution shows that some young individuals are operated upon too (Table 2), and the indication for operation upon cases under the age of 14 has in most of them been coxitis.

TABLE 1

The aetiological diagnosis of 360 arthrodesis and arthroplasties of the hip joint.

Osteoarthritis	262
Rheumatoid arthritis	4
Coxitis	11
Post-traumatic conditions	31
Congenital dislocation (Adults)	48
Postpoliomyelitic paralytic hip	4
	360

TABLE 2

The age distribution of 360 arthrodesis and arthroplasties of the hip joint.

Age at operation	Arthrodesis	Arthroplasties	Sum
Under 10 years	4	2	6
10-14 years	6	6	12
15-19 years	14	10	24
20-29 years	13	28	41
30-39 years	16	29	45
40-49 years	20	48	68
50-59 years	24	56	80
60-69 years	13	57	70
70-79 years	1	13	14
Sum	111	249	360

Table 3 shows the result of all the 360 hips belonging to 297 individuals operated upon. The requirements for an excellent result classification have been: 1. For arthrodesis: Consolidation, functional good position, full time working ability, and no pain. 2. For arthroplasty: satisfactory mobility with more than 60 degrees flexion, full time working ability, no pain apart from overexertion, and satisfactory stability.

Table 4 shows the results for different methods in per cent. It is evident that in our hands the result after Smith-Petersen cup-plasty is better than after the other types of arthroplasty. The main observation time after Judet's replacement arthroplasty was over 7 years, and after intramedullary replacement arthroplasty 5.5 years.

TABLE 3

The results of 360 operated hips (adults) operated upon for osteoarthritis, post-traumatic conditions, and congenital dislocation.

Result	Category of operation					Sum
	Arthrodesis	Different types of arthroplasties				
		Smith-P. cup-plasty	Judet prosthesis	Intramed prosthesis	Other methods	
Excellent	79	40	4	6	2	131
Good	19	53	14	15	4	105
Fair	8	28	8	9	2	55
Poor	3	27	11	14	1	56
Dead	0	0	0	0	0	0
Not followed-up or dead later on	2	6	2	3	0	13
Sum	111	154	39	47	9	360

22 cases with bad results after arthroplasty have been reoperated and undergone arthrodesis with excellent or good results.

TABLE 4

Percentage comparison between the results of arthrodesis and different types of arthroplasties of the hip joint. (For the numbers: see Table 1).

Result	Category of operation			
	Arthrodesis	Different types of arthroplasties		
		Smith-P. cup-plasty	Judet prosthesis	Intramed prosthesis
Excellent	72.4 %	27.1 %	10.8 %	13.6 %
Good	17.7 %	35.8 %	37.8 %	34.1 %
Fair	7.3 %	19.8 %	21.6 %	20.5 %
Poor	2.6 %	18.2 %	29.8 %	31.8 %
	100.- %	100.- %	100.- %	100.- %

Table 5 is a percentage comparison between arthrodesis on the one side and all types of arthroplasties together on the other. According to the requirements for classification the result after arthrodesis is far superior. The drawbacks of even an excellent anchylosic hip must, however, be considered: The inconvenience in being unable to bend the hip joint, the greater vulnerability of the corresponding femur, and the long-time tendency to instability of the corresponding knee joint.

TABLE 5
Percentage comparison between the results after arthrodesis and all the arthroplasties together.

	Arthrodesis	Arthroplasties
Excellent	72.4 %	21.8 %
Good	17.7 %	36.1 %
Fair	7.3 %	19.7 %
Poor	2.6 %	22.4 %
	100.- %	100.- %

The impairment of the result of arthrodesis was in 6 cases due to low back pain, and in one case pain in the corresponding knee joint. Low back pain after arthrodesis in older patients is rather common during and after the first period of training, but in most cases it subsides in a few weeks. Persistent low back pain after hip arthrodesis is therefore not common providing the spine has a good alignment in standing position. An ankylotic hip with a static scoliotic spine because of malposition of the hip (usually abduction) will very often sooner or later induce low back pain. *The position of the ankylotic hip in the frontal plane should therefore in all cases be between 2-5 degrees adduction even in cases with a considerable shortening of the corresponding leg.* The shortening must be corrected by means of orthopaedic foot-wear corrections.

An osteochondrotic lumbar spine is no contraindication for hip arthrodesis providing a good alignment of the spine follows after operation. An osteochondrotic lumbar spine with induced scoliotic curve after an ankylotic hip in abduction is on the other hand very often painful.

Many of our patients are heavy workers, farmers, fishermen, lumber workers, miners and sailors. A very small number of these patients can return to their heavy work after a hip arthroplasty for a unilateral hip lesion. After successful arthrodesis, however, most of them can resume their former jobs as heavy workers, sailors, and truck-, bus- and taxi-drivers.

A successful arthroplasty will do very well for patients with intellectual work and plain office work, and in many cases house-wives are also well off with an arthroplasty. However, we think that even in the latter occupations patients with unilateral hip lesions will be better off with an arthrodesis than with an arthroplasty.

In bilateral cases of hip osteoarthritis the possibility of going back

to heavy work is rather slight, but if the patient is young enough, he can be rehabilitated to an easier job. The treatment of choice in these cases is an arthrodesis on the one side and an arthroplasty on the other.

TABLE 6

*Working ability after unilateral hip operation for unilateral hip lesions.
Patients over 70 years of age are not included in this observation.*

Working ability	Category of operation		Sum
	Arthrodesis	Arthroplasty	
Full time work	58	65	123
	84.1 %	60.2 %	69.5 %
Part time work	8	17	25
	11.6 %	15.7 %	14.1 %
Unable to work	3	26	29
	4.3 %	24.1 %	16.4 %
Sum	69	108	177
	100.- %	100.- %	100.- %

Two disadvantages of arthrodesis, the long-lasting recumbency in a big plaster spica and the tendency to pseudarthrosis are overcome by the new method published in another report in this issue. By means of a solid and reliable fixation this method allows the patient out of bed a few days after operation with a short spica, and he can walk around and stay at home during the convalescent period.

TABLE 7

Working ability after uni- or bilateral hip operation for bilateral hip lesion.

Working ability	Category of operation		Sum
	Arthrodesis	Arthroplasty	
Full time work	28	47	75
	70.- %	39.9 %	47.5 %
Part time work	8	32	40
	29.- %	27.1 %	25.3 %
Unable to work	4	39	43
	10.- %	33.- %	27.2 %
Sum	40	118	158
	100.- %	100.- %	100.- %

Only 26 out of 158 with bilateral hip lesion had bilateral hip operation: 7 work full-time, 5 work part-time and 14 are unable to work.

Table 6 shows the working ability after operative treatment of unilateral lesions of the hip joint in adults (osteoarthritis, post-traumatic conditions and old congenital dysplasia).

Table 7 demonstrates the working ability after uni- or bilateral hip operation for bilateral hip lesion. According to our experience an arthroplasty on one side for bilateral hip lesion usually induces greater discomfort in the non-operated side after the operation, but an arthrodesis usually reduces the discomfort in the other side. Because of that the working ability after a unilateral arthrodesis for bilateral hip lesion is much better than after a corresponding arthroplasty.

S U M M A R Y

From 1943 till 1960 360 hip joints with osteoarthritis, severe post-traumatic conditions, and congenital dislocations (adults) were operated upon, the procedure being arthrodesis or some type or other of arthroplasty. Osteoarthritis has been the main indication for surgery. The result after arthrodesis is far superior to arthroplasty.

The working ability of heavy workers is especially better after an arthrodesis than after an arthroplasty. The treatment of choice of severe disabling bilateral hip lesions is arthrodesis on the one side and arthroplasty on the other.

Concerning the arthroplasties in our hands the result after Smith-Petersen cup-plasty is better than the result after the other types of arthroplasty. Persistent low back pain after hip arthrodesis is not common providing the ankylotic hip has a functional good position giving the spine a good alignment. The functional best position of the ankylotic hip is about 25 degrees flexion and from 2 to 5 degrees adduction and a few degrees external rotation. An osteochondrotic lumbar spine is no contraindication for hip arthrodesis providing a good alignment of the spine follows after the fusion.

R E S U M E

De 1943 à 1960, 360 articulations de la hanche avec ostéoarthrite, lésions posttraumatiques graves et dislocations congénitales (adultes) ont été opérées selon la procédure de l'arthrodèse ou d'une espèce d'arthroplastie. L'ostéoarthrite a été la principale indication de l'intervention chirurgicale. Le résultat après l'arthrodèse est sensiblement supérieur à celui de l'arthroplastie.

La capacité de travail chez ceux ayant à fournir un travail dur, en particulier, est meilleure après une arthrodèse qu'après une arthroplastie. Le traitement de choix dans les cas de grave incapacité provoquée par des lésions bilatérales de la hanche est l'arthrodèse d'un côté et l'arthroplastie de l'autre.

En ce qui concerne les arthroplasties que nous avons eues entre nos mains, le résultat obtenu par la méthode de Smith-Petersen est meilleure que celui obtenu par les autres types d'arthroplastie. Des douleurs lombaires persistantes après l'arthrodèse de la hanche ne sont pas communes, à condition que la hanche ankylosée ait une bonne position fonctionnelle donnant un bon alignement à la colonne vertébrale. La meilleure position fonctionnelle de la hanche ankylosée est d'environ 25 degrés de flexion, entre 2 et 5 degrés d'adduction et quelques degrés de rotation externe. Une colonne lombaire ostéochondritique n'est pas une contre-indication de l'arthrodèse de la hanche à condition d'un bon alignement de la colonne après la fusion.

ZUSAMMENFASSUNG

Von 1943 bis 1960 wurden 360 Hüftgelenke mit Osteoarthritis, schweren posttraumatischen Zuständen und angeborenen Hüftverrenkungen (Erwachsene) mittels Arthrodesis oder einer Syme Type oder anderen Form von Arthroplastik operiert. Osteoarthritis war die Hauptindikation für den chirurgischen Eingriff. Das Ergebniss nach Arthrodesis ist dem der Arthroplastik weit überlegen.

Die Arbeitsfähigkeit des Schwerarbeiters ist vor allem besser nach einer Arthrodesis als nach einer Gelenksplastik. Die Behandlung der Wahl von stark invalidisierender doppelseitiger Hüfterkrankung ist die Arthrodesis auf einer Seite und die Arthroplastik auf der anderen.

Hinsichtlich der von uns ausgeführten Arthroplastiken ist zu sagen, dass das Ergebnis nach Smith-Petersens Gelenksplastik besser ist als nach anderen Methoden der Arthroplastik. Anhaltende Kreuzschmerzen nach Hüftversteifung ist keine gewöhnliche Erscheinung, vorausgesetzt dass die Hüfte in guter funktioneller Stellung versteift ist, so dass die Wirbelsäule gute Anpassungsmöglichkeiten hat. Die beste Funktionsstellung der versteiften Hüfte ist ungefähr 25° Beugung, 2–5° Adduktion und wenige Grade Aussenrotation. Eine osteochondrotische Lendenwirbelsäule ist keine Kontraindikation gegen Hüftarthrodesis vorausgesetzt dass eine gute Anpassung nach der Versteifung zustande kommt.

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