

From the Orthopaedic Clinic (Head: Gösta Kollberg) of the Central Hospital,  
Karlstad, Sweden.

## THE VOSS OPERATION IN OSTEOARTHRITIS OF THE HIP

*By*

GÖSTA KOLLBERG and GUNNAR LUNDHOLM

### INTRODUCTION

Osteoarthritis of the hip is generally speaking a disease of advanced age, so that owing to increased longevity it is acquiring ever greater importance. However, the condition is not restricted to the elderly, but may be encountered in far younger age groups. It must be expected that in the future we shall have ever more to do with this disease.

The pathological changes in osteoarthritis of the hip consist, briefly, in degeneration of the cartilage which loses its elasticity. This gives rise to subchondral sclerosis, formation of cysts and osteophytes in the joint margins. All these changes are visualized by X-rays.

Among the aetiological factors, incongruence in the joint is probably the most important one. This incongruence may be due to several causes. It may be congenital, due to dysplasia of the femoral head or acetabulum or both, with or without co-existing subluxation of the joint. It may be acquired, for instance a sequel of coxa plana or epiphysiolysis, and it may of course also be traumatic. Another aetiological factor is no doubt joint infection. Yet another group is made up by so-called senile osteoarthritis whose cause has not yet been definitely elucidated.

The three symptoms which predominate in osteoarthritis of the hip are pain, limitation of movement, and an incorrect position.

In general, the pain is the most disturbing symptom, and the one which makes the patient consult a doctor. A distinction is made between pain on exertion and pain at rest.

The limitation of movement is partially explicable by the deforming changes, but is no doubt often pain-conditioned.

Pronounced contractures of the muscles and other soft tissues gives rise to incorrect positions, mainly a position of flexion and adduction.

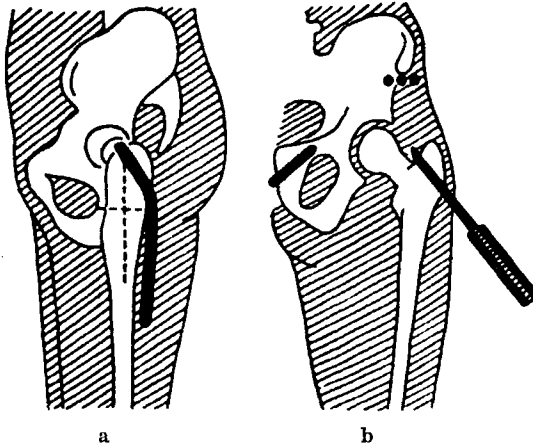


Fig. 1.

The Voss operation.

- a) Lateral incision of the skin (————) and the incision of the fascia (-----).  
 b) Operative field from the anterior aspect. The skin incision (———— and -----) and the site of cutting the bone and muscles.

The treatment of oostearthritis of the hip is varied. Conservative methods have their value, but as a rule their effect is merely transient.

In the more disabling cases considervative treatment is usually of little use. The disease has, therefore, been treated by various surgical procedures of which only arthrodesis, arthroplasties, and intertrochanteric osteotomies will be mentioned here. The last-mentioned type of operation seems to have been predominant during the past few decades.

#### SURGICAL METHOD

In 1955 *Voss* described a new surgical procedure for the treatment of oostearthritis of the hip, the so-called temporary hanging hip ("temporäre Hengehüfte") which is based on an entirely new principle. In his opinion, the most important factor is that the muscles around the joint are in a state of increased tension. Owing to this increased muscular tension the articular cartilage is exposed to an abnormal pressure, causing a so-called pressure oostearthritis. Accordingly, the therapeutic principle should be an attempt to interrupt this condition of abnormal muscle tension. Thereby the pressure in the joint is decreased, and the cartilage is afforded a possibility for regeneration.

Normally, the pressure in the hip joint is due mainly to the muscles surrounding the joint. According to *Pauwel's* (1961) calculations, this so-called dynamic muscle pressure is about four times the pressure caused by the weight of the body upon weight-bearing, e.g. walking. Muscular contractures in oostearthritis of the hip may

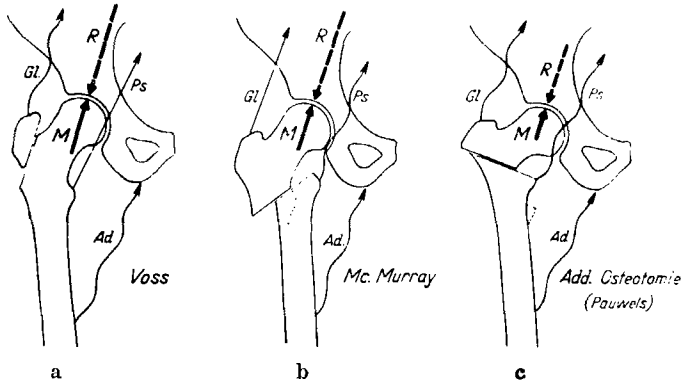


Fig. 2.

The effect of surgery by the methods of Voss, MacMurray, and Pauwel is obtained by decreasing the tension of the muscles around the hip joint.

multiply this pressure. In other words, the joint is exposed to considerable force. Voss' method involves (Fig. 1):

- (1) Tenotomy of the fascia lata by a cross incision.
- (2) Chiselling of the greater trochanter or tenotomy of the attachments of the gluteus medius and gluteus minimus on the greater trochanter.
- (3) Adductor tenotomy.
- (4) Tenotomy of the anterior iliac spine muscles.

Simultaneously with the adductor tenotomy, it is easy to excise the obturator nerve. This modification was used in about half our cases.

The effects of Voss' operation, MacMurray's osteotomy, and Pauwel's osteotomy are illustrated in Fig. 2.

#### AFTER-TREATMENT

In Voss' method the after-treatment is of the utmost importance, as pointed out by many authors, not least by Voss himself. On the whole, we have followed the instructions given by Voss. After the operation the patient performs activating exercises from the very first day, while he is kept in bed with a hip traction of 3 kg. Anticoagulant therapy was instituted on the third day. After three weeks in bed, during which the patient is often allowed to sit, he is taken into a walking chair, and as soon as possible he is permitted to walk with two Canadian crutches, without supporting on the operated leg. The stay in hospital is a total of 5-6 weeks. On discharge, the patients are instructed not to subject the leg to weight-bearing to any extent for another 6 weeks.

## MATERIAL

From the autumn of 1961 through 1962, 42 patients were submitted to the Voss operation in the Karlstad Clinic. Two cases were bilateral, so that the material comprises 44 hips. Twenty four of the patients were females and 18 males (Table 1). The average age was 61 years, range 46–71 years (Table 2). The material consists of patients with osteoarthritis of the hip of varying aetiology, cases with evident joint incongruence predominating. X-rays showed in most cases severe osteoarthritis and in some cases moderate osteoarthritis. No case had mild radiological changes.

TABLE 1  
*Osteoarthritis of the Hip Treated by the Voss Operation.*

	18 ♂	42 patients (44 operations)
	24 ♀	
Right hip .....		17
Left hip .....		23
Bilateral .....		2
Voss operation only .....		24
Voss operation + excision of obturator nerve .....		20

TABLE 2  
*Age Distribution of the 42 Patients who Underwent Voss' Operation.*

	♂	♀
40–49	—	2
50–59	4	9
60–69	13	13
70–79	1	—

The indications for Voss' operation was long-lasting symptoms which did not respond to any major extent to conservative treatment. The majority of the operated patients had previously spent some time in hospital to have conservative treatment. The radiological changes played no notable part in deciding the indications.

## RESULTS AND DISCUSSION

The follow-up period is short, but not shorter than 6 months (Table 3). In our series, however, the results in the three groups having different follow-up periods were similar.

We investigated pain on weight-bearing, pain at rest, the distance which the patients could walk, and the mobility of the hip (Table 4). Before the operation all the patients had pain on weight-bearing, and 40 also had pain at rest. After the operation a distinct improvement of the pain on weight-bearing had been obtained in 39 out of the 44 cases. Four were unchanged and one worse. The pain at rest improved in 36 cases, remained unchanged in 3 and aggravated in one case.

TABLE 3  
*Follow-Up Period.*

(44 operations)

6-12 months .....	15
12-18 months .....	14
18-24 months .....	15

TABLE 4  
*Result of Voss Operation.*

(In some cases supplemented by excision of the obturator nerve).

	Pain on weightbearing	Pain at rest	Walking distance	Mobility of hip
Improved .....	39	36	28	15
Unchanged .....	4	3	13	26
Worse .....	1	1	3	3

TABLE 5  
*Final Assessment.*

	Subjective	Objective
Improved .....	36 (82 %)	35 (80 %)
Unchanged .....	6	7
Worse .....	2	2

The walking distance had increased in 28 cases, considerably in some, *e.g.* from 20-30 m to a couple of km.

The mobility of the hip had increased in 15 cases, but as a rule there was no major increase. In several cases there was an improvement of the incorrect position of the hip joint. Thus, like *Harff & Wandschneider* (1962) we were unable to find any essential increase in hip mobility, unlike *Seyfarth* (1948) and *Voss* (1956) who recorded such an increase. Some degree of muscular insufficiency is common after the operation, but it is transient and as a rule not annoying to the patient.

In about half our cases the Voss operation was supplemented by excision of the obturator nerve. The results in these cases were the same as following the Voss operation alone.

In the final evaluation the main emphasis was laid on the patients' statements regarding the pain. Our final assessment was based on the patients' subjective interpretation and the objective findings (Table 5).

The results are in keeping with those of others. For instance *Küntsch* (1962) reported 82 per cent good results in a series of approx. 500 cases. *Weickert* (1961) obtained 89 per cent good results among 39 cases, and a number of others have reported 70–80 per cent good results.

Among operative complications infection was of most importance in our series, as it occurred in not less than 4 cases (9 per cent) which is a high incidence. The infecting organism was *Staph. aureus* in all cases. Three subsided without any lasting sequel, while one patient developed severe coxitis and remained in hospital for more than 6 months; the end result was poor.

Bilateral thrombosis in the lower legs, despite prophylactic anticoagulant therapy was recorded in one case. In this connection it may be mentioned that in a series of 41 patients *Harff & Wandschneider* (1962) had two fatal cases of embolism. *Voigt* (1958) too has reported death from embolism. Thus, although the Voss operation is a relatively minor procedure, it is not quite devoid of risk.

#### SUMMARY

The Voss operation, *i.e.* so-called temporary hanging hip (“temporäre Hengehüfte”), has proved an applicable method in the treatment of osteoarthritis of the hip. In 42 patients (two with bilateral involvement), it resulted in considerable improvement in about 80 per cent. The improvement consisted in appreciably decreased pain on weight-bearing and at rest, and to some extent an increased walking distance and increased mobility of the hip. Besides, the method possesses the advantage of being a relatively minor procedure.

#### RESUME

Une opération d'après la méthode de Voss dans ce qu'on appelle la hanche pendante temporaire s'est montrée être une méthode utilisable dans le traitement de la coxarthrose. L'opération a provoqué chez 42 malades (deux malades opérés bilatéralement) une amélioration marquée dans environ 80 pour cent des cas, une diminution marquée des douleurs en position de charge et de repos et, dans une certaine mesure, une plus grande liberté de marche et une mobilité accrue de la hanche. Parmi les avantages de la méthode, on peut mentionner qu'il s'agit d'une intervention relativement peu importante.

## ZUSAMMENFASSUNG

Die Operation nach Voss zur Erreichung einer zeitweiligen Hängehüfte, hat sich als anwendtbare Methode zur Behandlung der Coxarthrose erwiesen. Die Operation gab bei 42 Patienten (zwei Patienten wurden doppelseitig operiert) eine deutliche Besserung in ungefähr 80 Prozent mit erheblich verringerten Belastungs- und Ruheschmerzen und bis zu einem gewissen Grade verlängerter Gangstrecke samtgesteigerter Hüftbeweglichkeit. Zu den Vorteilen der Methode gehört, dass sie ein verhältnismässig geringer Eingriff ist.

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