ORIGINAL ARTICLE

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Colonna capsular arthroplasty: a 33-year follow-up of four patients

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Abstract We evaluated the results of Colonna capsular arthroplasty in 4 patients with unilateral congenital dislocation of the hip. All of these patients were female, aged 10–14 years at the time of surgery, and 42–50 years at the time of follow-up. The most striking finding in this study was the good ability to walk. Although radiographs showed considerable joint degeneration, all of these patients had only mild to moderate pain in the hip.

Résumé Nous avons évalué les résultats de l'arthroplastie capsulaire selon Colonna dans le cas de 4 malades atteints de luxation congénitale de la hanche unilatérale. Toutes étaient de sexe féminin, âgées de 10 à 14 ans à l'intervention chirurgicale et de 42 à 50 ans au délai d'observation. Le résultat le plus remarquable dans cette étude réside dans la bonne qualité de la marche. Bien que la radiologie montre la présence d'une forte dégénération coxale, les malades ne souffrent que de douleurs légères ou modérées de la hanche.

Introduction

In 1932 Colonna [3] described a two-stage surgical procedure for congenital dislocation of the hip. The first stage consists of skin or skeletal traction preliminary to open surgery, moving the femoral head distally. The sec-

ond stage consists of reaming of the original acetabulum, and reduction of the femoral head covered with the capsule [4]. This procedure is referred to as the Colonna capsular arthroplasty.

Although Colonna reported good results in children older than 3 and younger than 8 years old [4–6], this surgical procedure has largely been abandoned because of the long immobilization period and frequent avascular necrosis of the capital femoral epiphysis [2].

In this paper we report the clinical and radiological results of 4 patients more than 30 years after they underwent Colonna capsular arthroplasty as teenagers.

Patients and methods

Between 1954 and 1964, Colonna capsular arthroplasty was performed on 11 teenage patients with congenital dislocation of the hip by a single surgeon at the University of Tokyo Hospital. We have reviewed 4 of these patients clinically and radiographically; the other 7 patients were lost to follow-up. The mean follow-up time was 33 (30–40) years. All the patients were female and had unilateral congenital dislocation of the hip. Skeletal traction was performed on all of the patients before surgery. In one patient (case 1), the joint capsule was surgically released 2 weeks prior to the arthroplasty. In another patient (case 2), intertrochanteric valgus osteotomy of the femur was performed 16 years after the arthroplasty.

Results

Table 1 summarizes the clinical details and the results. The recent radiographs showed significant findings of osteoarthritis. In 3 patients (cases 1, 3, and 4), the joint space had diminished and the femoral head had migrated superolaterally at the time of follow-up (Fig. 1). However, the joint space was moderately maintained in 1 patient (Case 2, Fig. 2).

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Table 1 Clinical details and results in 4 patients treated by Colonna capsular arthroplasty

Case no.	Side	Age (years)		Severin grade	Charnley's hip score			Trendelenburg's sign ^c	Leg length discrepancy (cm)	Tönnis grade
		OP ^a	FU ^b		Pain	Movement	Walking			
1	Right	10	50	VI	5	3	5	+	2.0	3
2	Right	11	42	V	5	4	6	-	2.0	2
3	Left	13	43	V	4	4	5	+	1.5	3
4	Left	14	44	V	5	4	5	+	2.5	3

^a Operation; ^b Follow-up; ^c +=positive; -=negative

Fig. 1a, b Case 3: 13-year-old girl. **a** Preoperative radiograph of the left hip (Severin grade V). **b** After 30 years, the patient had moderate hip pain; the radiograph shows the findings of advanced osteoarthritis (Tönnis grade 3)

Fig. 2a-c Case 2: 11-year-old girl. **a** Preoperative radiograph of the right hip (Severin grade V). **b** Two months after Colonna capsular arthroplasty; the reamed acetabulum contains the femoral head. **c** After 31 years, the patient had slight hip pain; the radiograph shows evidence of moderate osteoarthritis (Tönnis grade 2). The patient had undergone additional intertrochanteric valgus osteotomy of the femur 16 years after Colonna capsular arthroplasty

Discussion

Despite the existing screening program for the detection of congenital hip dislocation in the newborn, late established dislocation of the hip is found occasionally [8, 11]. Although the number is very small, some patients seek treatment after the age of 10 years. Treatment of such children is extremely difficult because of the soft tissue and bone deformities.

The long-term results of Colonna capsular arthroplasty have been reported only for patients younger than 10 years [2, 7]. In these studies, most of the hips showed satisfactory function, despite a reduced range of movement, 10–30 years after the operation. However, in some patients, functional deterioration was apparent, with radiographic evidence of serious joint degeneration due to avascular necrosis of the femoral capital epiphysis. These authors advocated Colonna capsular arthroplasty as a salvage procedure when other operative methods had failed or were contraindicated. Although the recall rate was only 36% in the present study, the results were similar to those found previously.

Our results indicate that Colonna capsular arthroplasty may be considered as a potential treatment for 10- to 14-year-old girls with unilateral congenital hip dislocation. We believe that some imaginative measures to bring down the femoral head without vascular disturbance may be necessary to improve the outcome of this classical procedure.

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