Midterm outcome of total hip arthroplasty for rapidly destructive coxarthrosis

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ABSTRACT

Purpose. To compare the midterm outcome in 12 women who underwent total hip arthroplasty (THA) for rapidly destructive coxarthrosis (RDC) and in 12 controls who underwent THA for osteoarthritis.

Methods. Records of 12 women aged 50 to 80 (mean, 72.3) years who underwent THA for RDC after a mean of 9 (range, 4–11) months since symptom onset were reviewed. They were compared with 12 age- and sex-matched controls who underwent THA for primary or secondary osteoarthritis. Acetabular bone deficiency of the 12 RDC patients was classified as type I (n=7), type II (n=4), or type III (n=1). Type I was treated with cementless THA, and types II and III were treated with THA with a cemented acetabular component. The femoral component was cementless. Pre- and post-operative Harris Hip Score was assessed. Radiographs of the hip were evaluated for implant migration, osteolysis, and periprosthetic radiolucency in the acetabulum and proximal femur.

Results. The 12 women who underwent THA for RDC and the 12 controls who underwent THA for osteoarthritis were comparable in terms of pre-, intra-, and post-operative parameters. After a mean follow-up of 9.3 years, the mean Harris Hip Score improved from 38.3 to 81.1 in RDC patients and from 43.6 to 84.2 in controls (p=0.13). One RDC patient had dislocation but did not require revision surgery. One RDC patient developed a radiolucent line <2 mm in zones 1 and 7 of the femoral component, but no migration occurred. No patient had progression of bony destruction, loosening, osteolysis, migration, or radiolucency of the acetabular component.

Conclusion. Despite the rapid destruction of the acetabulum and femoral head in RDC patients, cemented or cementless THA achieved a good midterm outcome comparable to that for patients with primary or secondary osteoarthritis.

Key words: arthroplasty, replacement, hip; osteoarthritis, hip

INTRODUCTION

Rapidly destructive coxarthrosis (RDC) is also known
as the Postel disease or rapidly destructive arthrosis of the hip.\textsuperscript{1,2} RDC is defined as progressive narrowing of the joint space by ≥2 mm/year or 50% joint-space narrowing in one year, leading to erosion of the subchondral bone.\textsuperscript{3,4} Its radiographic findings mimic those of arthritis, rheumatoid, seronegative arthritis, or osteonecrosis with secondary osteoarthritis, but patients have no signs of any infectious, neurological, metabolic, endocrine, or inflammatory disorder. It mainly affects elderly women and leads to severe disability.

Initial radiographs of the hip joint are usually normal, but 6 to 12 months after symptom onset, rapid destruction, resorption, and subluxation of the femoral head and/or acetabulum and minimal spur formation occur (Fig.).\textsuperscript{1,4} Subchondral insufficiency fracture of the femoral head is considered the cause of RDC in elderly women with osteopenia and as the preceding sign of RDC.\textsuperscript{5,6}

Total hip arthroplasty (THA) is the treatment of choice.\textsuperscript{1} It has demonstrated good-to-excellent midterm outcome, with a revision rate of 3%.\textsuperscript{7} This study compared the midterm outcome in 12 women who underwent THA for RDC and in 12 controls who underwent THA for osteoarthritis.

**MATERIALS AND METHODS**

Records of 12 women aged 50 to 80 (mean, 72.3) years who underwent THA between 2000 and 2009 for RDC after a mean of 9 (range, 4–11) months since symptom onset were reviewed. They were compared with 12 age- and sex-matched controls who underwent THA for primary or secondary osteoarthritis.

According to the American Academy of Orthopaedic Surgeons,\textsuperscript{8} acetabular bone deficiency of the 12 women with RDC was classified as type I (n=7), type II (n=4), or type III (n=1). Type I was treated with cementless THA using the Reflection cup (Smith & Nephew, London, UK) [n=3] or the Converge cup (Zimmer, Warsaw [IN], USA) [n=4], whereas types II and III were treated with THA with a cemented acetabular component (n=5). THA

**Table**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>RDC (n=12)</th>
<th>Control (n=12)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>72.3±8.18</td>
<td>69.2±6.06</td>
<td>0.384</td>
</tr>
<tr>
<td>No. of females:males</td>
<td>12:0</td>
<td>12:0</td>
<td></td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>25.8±7.06</td>
<td>23.1±3.85</td>
<td>0.386</td>
</tr>
<tr>
<td>Acetabular cup used</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Converge (cementless)</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>- Reflection (cementless)</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>- Cemented</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Femoral stem used</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Natural Hip (cementless)</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>- Synergy Select (cementless)</td>
<td>9</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Follow-up (months)</td>
<td>115.3±31.0</td>
<td>107.6±27.4</td>
<td>0.909</td>
</tr>
<tr>
<td>Operating time (minutes)</td>
<td>127.9±35.4 (79–173)</td>
<td>110.6±17.2 (88–135)</td>
<td>0.268</td>
</tr>
<tr>
<td>Blood loss (g)</td>
<td>473.9±154.3 (286–780)</td>
<td>353.9±90.8 (180–450)</td>
<td>0.102</td>
</tr>
<tr>
<td>Harris Hip Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preop</td>
<td>38.3±3.07 (33–42)</td>
<td>43.6±10.3 (29–56)</td>
<td>0.182</td>
</tr>
<tr>
<td>Final follow-up</td>
<td>81.1±3.20 (75–86)</td>
<td>84.2±4.43 (82–92)</td>
<td>0.130</td>
</tr>
</tbody>
</table>

* Data are presented as mean±SD (range) or no. of patients
was performed through the posterolateral approach with intact trochanter. In one patient with bony destruction of the acetabulum, the acetabular roof was reconstructed with the Kerbuoll-type plate. The femoral component was cementless: the Synergy Select stem (Smith & Nephew) \([n=9]\) and the Natural Hip stem (Zimmer) \([n=3]\).

Pre- and post-operative Harris Hip Score\(^9\) was assessed. Anteroposterior and lateral radiographs of the hip were evaluated for implant migration, osteolysis, and periprosthetic radiolucency, with the acetabulum divided into 6 zones,\(^10\) and the proximal femur divided into 7 zones.\(^11\)

Independent \(t\) test was used for between-group comparison. A \(p\) value of <0.05 was considered statistically significant.

RESULTS

The 12 women who underwent THA for RDC and the 12 controls who underwent THA for osteoarthritis were comparable in terms of pre-, intra-, and post-operative parameters (Table). After a mean follow-up of 9.3 years, the mean Harris Hip Score improved from 38.3 to 81.1 in RDC patients and from 43.6 to 84.2 in controls \((p=0.13, \text{Table})\). One RDC patient had dislocation but did not require revision surgery. One RDC patient developed a radiolucent line <2 mm in zones 1 and 7 of the femoral component, but no migration occurred. No patient had postoperative infection, nerve palsy, or pulmonary embolism, nor was there progression of bony destruction, loosening, osteolysis, migration, or radiolucency of the acetabular component.

In 8 of 12 RDC hips, histological examination was carried out to exclude osteonecrosis or infection. All showed degeneration of the articular cartilage consistent with osteoarthritis, with no signs of septic inflammation.

DISCUSSION

Theoretically, the outcome of THA for RDC should be less satisfactory, because of femoral and acetabular bone loss, and poor bone stock and quality of the remaining bone. Poor bone quality is a risk factor for survival of THA.\(^12\) In patients with RDC, there is evidence of subchondral insufficiency fracture in the weight-bearing portion of the femoral head,\(^5\) and trabecular fracture in the vicinity of the articular surface of the femoral head.\(^13\)

In 44 hips with RDC treated with cemented THA and followed up for 6 months to 3 years, 13 (31%) hips had a clear space between the acetabular bone and cement, and 4 (9.5%) hips had a loose socket.\(^1\) In 100 patients with RDC treated with cemented THA and followed up for a mean of 7.83 years, the Merle d’Aubigne score was excellent or very good in 95 hips, and fixation was stable in 94 acetabular implants and 97 femoral implants.\(^14\) In 10 patients with RDC treated with hybrid configuration \((n=9)\) or non-cemented THA \((n=1)\) and followed up for a mean of 6 years, no patient had progression of the erosive process, and all had bone ingrowth in the acetabular component and stable fixation of the femoral component except for one.\(^15\) In 8 patients with RDC treated with cementless THA and autologous cancellous bone grafting for acetabular wall reconstruction and followed up for a mean of 5 years, no patient had progressive acetabular bone loss, and all had good results.\(^16\) In 20 patients who underwent primary cemented THA using the Kerbuoll-type acetabular reinforcement device for RDC, the outcome was satisfactory from 3 to 11 years.\(^17\)

Limitations of this study were the small sample size and the retrospective nature. Nonetheless, a larger series is difficult to obtain owing to the rare occurrence of RDC (3.1% of THA) in our population.

CONCLUSION

Despite the rapid destruction of the acetabulum and femoral head in RDC patients, cemented or cementless THA achieved a good midterm outcome comparable to that for patients with primary or secondary osteoarthritis.

DISCLOSURE

No conflicts of interest were declared by the authors.

REFERENCES