Incidence of dislocation after hip arthroplasty

Comparison of different registration methods in 408 cases

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We studied four different methods of registration of dislocations after total hip arthroplasty (THA) carried out at Malmö General Hospital during 1979–1988. Established registers failed to incorporate more than half of the dislocations and approximately one third of the patients, compared with a manual retrospective review of the original operating cords and the patient files. In 22 percent of the cases the first dislocation occurred more than one year postoperatively. Therefore different studies must use similar methods of registration concerning all details about dislocations in order to allow an adequate comparison of THA dislocation parameters.

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Submitted 91-07-20. Accepted 92-02-03

Dislocation after total hip arthroplasty has been reported to occur in 0.4 to 15 percent of the cases (Carlsson and Gentz 1977, Etienne et al. 1978, Wroblewski 1986, Newington et al. 1990). This great variation can partially reflect different surgical techniques, types of prosthesis or selection of patients. However, comparisons of data on the incidence of dislocation must also consider how the data have been obtained and what they deal with.

We have analyzed the reliability of registration of dislocations by monitoring different registers, and determined how documentation and registration may be presented in order to make studies comparable.

Patients and methods

During 1979–1988, 2 068 primary and 431 revision THA were carried out at the Orthopedic Department of the General Hospital in Malmö, the only hospital in the city doing major elective hip surgery and treating complications such as dislocations. The following registers were analyzed.

A. The official hospital records of in-patient diagnoses.

B. The official hospital records of operations.

C. The Swedish National Register of Hip Arthroplasty (Ahnfelt et al. 1990).

D. The original operating register of the department and patient records.

A. Hospital diagnosis

A slight modification of the WHO adopted ICD-classification is used in Sweden. The system was changed on January 1, 1987, from ICD-8 to ICD-9. All patients receiving hospital care must obtain at least one main diagnosis. In Malmö, the correct codes for diagnoses are supervised by the chief secretary. All codes were then registered directly in a central data system covering the entire city of Malmö (AFI). The register of in-patient diagnoses was not possible to examine before 1987. The classification in Malmö was previously made according to the preoperative hip diagnosis alone, although there would have been a possibility to file the dislocations under the number 997.60. The newer ICD-9 system after 1987 provides a better registration using the number 996E. This has given the in-patient register an accuracy comparable with the other official registers.

B. Operation register

All treatment of patients in the operating theater is specified in the original operating register at the department. In the individual patient's file, every operation is marked with an ICD code number.

C. The National Register

The Swedish National Register of Hip Arthroplasty started in January 1979. It has a coordinating center

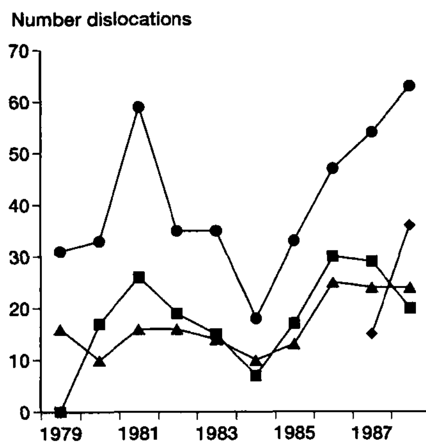

Figure 1. The number of dislocations after THA at Malmö General Hospital 1979–1988. ● patient files (n 408); ◆ in-patient diagnosis (n 51); ▲ national register (n 168); and ■ hospital records (n 180).

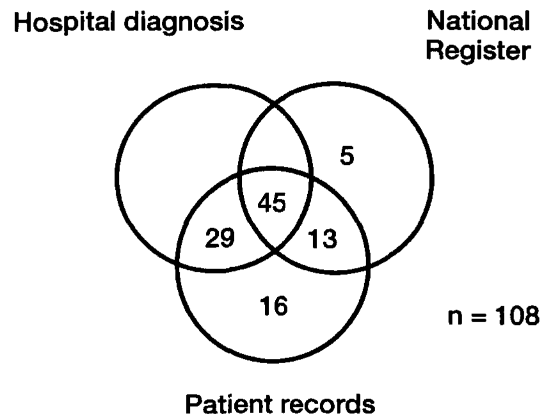

Figure 2. Number of patients with dislocation in different registers.

situated in Gothenburg and is supposed to receive complete hospital records on all reoperated hip prostheses from all orthopedic and surgical departments in Sweden. Reoperation is defined as a new hip operation on a patient who previously has had a THR on the same side. A reoperation with exchange of one or both prosthetic components or removal of the entire implant system is entitled revision. The National Register has primarily focused on revisions, since the extent of reporting minor reoperations has been decided by each department.

D. Patient records

The original operating register of the Orthopedic Department in Malmö during 1979–1988 was independently checked by two of the authors. All documented reductions or revisions due to recurrent dislocation and technical errors were selected. Subsequently, the complete files of the reoperated patients were examined for additional dislocations treated inside or outside the Malmö hospital. A cross-check with the other registers was also performed.

Dislocation has been defined as a documented positioning of the femoral head outside the acetabular cup. All primary dislocations in Malmö were confirmed by radiography. In recurrent cases we also accepted clinical diagnoses by an orthopedic surgeon.

Reduction was mainly attained with general anesthesia or analgesia in the operating theater using fluoroscopy. Some recurrent cases were reduced with analgesia by the orthopedic surgeon on the ward or in the emergency room. All nonrecurrent dislocations were hospitalized after reduction.

Reduction in orthopedic departments outside Malmö has been confirmed by copies of the individual case records before our registration. Sensations of subluxation or "dislocation" registered by the patient and treated by himself or his relatives were not included.

Results

The total number of dislocations registered by the official hospital records of operations was 180, by the Swedish National Register 168 and by the original operating register completed with patient files 408 (Figure 1). 262 (64 percent) of our dislocations were reduced in the operating theater.

Five patients were documented in the National Register alone (Figure 2). One was given an incomplete operation code at revision. Two patients were nonresidents and primarily reduced elsewhere and one was reduced at a nearby hospital to which the patients were referred for 3 weeks in 1986 due to a strike. The final dislocation was not registered when treated in a hospital ward but when revised later on for another reason.

45 percent of the dislocations occurred within 4 weeks of the operation but 24 out of 108 (22 percent) were diagnosed after one year or more (Table 1). The overall incidence of dislocation one year postoperatively was 3.4 percent.

Table 1. Accumulated number of postoperative total hip dislocations

Years postop	Primary	Revision
0.04	15	5
0.08	41	8
0.17	55	16
0.25	56	17
0.50	61	19
0.75	65	19
1.0	67	19
2.0	70	21
3.0	70	22
4.0	70	22
5.0	74	22
10	82	22
15	85	22
20	86	22

Discussion

Our findings demonstrate a considerable loss of both patients and dislocations if only official registers are monitored. The register of in-patient diagnoses was incomplete, and it did not add any cases to our manual check of operating registers and patient files. The inadequacy of other registers may be due to incomplete reporting or suboptimal routines including miscoding and misprinting. Therefore, a manual review of original operating registers and patient files seems to be an accurate way of tracking dislocations.

Correct registration requires routines with a minimum of persons involved, access to all original documents, knowledge of the local hospital routines and understanding of the purpose of the register. A National Register is dependent on an adequate supply of reports but represents the best method of following patients who moved from their original community or received acute treatment elsewhere. These demands will increase with changes in the Swedish Welfare System in the 1990s, permitting the patients to more freely choose their hospital regardless of location.

Some previous authors (Ritter 1976, Fackler 1979, Woo and Morrey 1982) have discussed incidence instead of frequency, but usually not in relation to a specific postoperative period with accumulated rates. Other reports have not considered the great variation in follow-up time, which in our study would have ranged from zero to almost 10 years.

A precise method would be to present the incidence 1, 2, 3 and 5 years after THA. Incidence registration would also promote studies of the survival function of the prostheses included. We agree with Woo and Morrey (1982) that a follow-up time of one year is insufficient to determine the true incidence of dislocation.

Comparisons between studies also require consideration of the number of dropouts and the selection principles. Efthekar (1976) presented a loss of 160 patients out of 1 560 THA, which is 20 times the number of the registered dislocations.

The patient distribution also influences the outcome. There is indirect evidence implying that abuse such as alcoholism (Lindberg and Carlsson 1982), as well as neuromuscular disorders and mental confusion (Kahn 1981) will increase the rate of dislocation. These patients are also more reluctant or unable to participate in any follow-up studies.

THA secondary to cervical hip fractures increase the risk of dislocation (Ahnfelt 1986, Nilsson et al. 1989), which is also the case in geriatric populations with THA (Ekelund 1990, Newington 1990). It is also well accepted that the surgeon's experience influences the result (Efthekar 1976, Dorr et al. 1983).

These factors must be well recognized before any relevant comparison between different studies of hip prosthesis and surgical approaches can be made.

However, all studies primarily depend on an adequate and precise registration in a well defined manner. A local prospective register at each department along with a properly functioning National register would then be an adequate method to gain a real experience of side effects after THA.

References

Ahnfelt L. Reoperated total hip arthroplasties in Sweden, 1979–1983. Thesis, Univeristy of Gothenburg, Gothenburg, Sweden 1986.

Ahnfelt L, Herberts P, Malchau H, Andersson G B J. Prognosis of total hip replacemnet. A Swedish multicenter study of 4,664 revisions. Acta Orthop Scand (Suppl 238) 1990; 61: 1–26.

Carlsson Å S, Gentz C F. Postoperative dislocation in the Charnley and Brunswik total hip arthroplasty. Clin Orthop 1977; 125: 177–82.

Coventry M B. Late dislocations in patients with Charnley total hip arthroplasty. J Bone Joint Surg (Am) 1985; 67 (6): 832–41.

Dorr L D, Wolf A W, Chandler R, Conaty J P. Classification and treatment of dislocations of total hip arthroplasty. Clin Orthop 1983; 173: 151–8.

Eftekhar N S. Dislocation and instability complicating low friction arthroplasty of the hip joint. Clin Orthop 1976; 121: 120–5.

Ekelund A, Rydell N, Nilsson O. Total hip arthroplasty in patients aged 80 aged years or older. Acta Orthop Scand (Suppl 239) 1990; 61: 86–7.

Etienne A, Cupic Z, Charnley J. Postoperative dislocation after Charnley low friction arthroplasty. Clin Orthop 1978; 132: 19–23.

Fackler C D, Poss R. Dislocation in total hip arthroplasties. Clin Orthop 1980; 151: 169–78.

Khan M A A, Brakenbury P H, Reynolds I S R. Dislocation following total hip replacement. J Bone Joint Surg (Br) 1981; 63: 214–8.

Lindberg H O, Carlsson Å S, Gentz C F, Pettersson H. Recurrent and non-recurrent dislocation following total hip arthroplasty. Acta Orthop Scand 1982; 53 (6): 947–52.

Newington D P, Bannister G C, Fordyce M. Primary total hip replacement in patients over 80 years of age. J Bone Joint Surg (Br) 1990; 72 (3): 450–2.

Nilsson L T, Strömqvist B, Thorngren K G. Secondary arthroplasty for complications of femoral neck fracture. J Bone Joint Surg (Br) 1989; 71 (5): 777–81.

Ritter M A. Dislocation and subluxation of the total hip replacement. Clin Orthop 1976; 121: 92–4.

Wroblewski B M. Charnley low friction arthroplasty. Review of the past, present status, and prospects for the future. Clin Orthop 1986; 210: 37–42.

Woo R Y, Morrey B F. Dislocations after total hip arthroplasty. J Bone Joint Surg (Am) 1982; 64 (9): 1295–306.