50 Years Ago in CORR

Complications in Replacement Arthroplasty of the Hip; Experience with 68 Additional Cases

Howard Mendelsohn, MD and Bernard N. Becker, MD CORR 1955;6:48–53

This month's symposium is devoted to complications in total joint arthroplasty. Surgeons have always been concerned about complications of their operations, and arthroplasty is no exception. Arthroplasty arises from two Greek words, *arthros* meaning joint and *plastikos* related to molding. The concept has been attributed to John Rhea Barton of Philadelphia, who osteotomized the upper end of the

Table 2

Complications and deaths			
Number of patients			66
Number of prostheses			68
Complication	Number of complications	Number of patients	Percentage of cases
Postoperative deaths	12	12	18%
Serious anesthetic complications and hemorrhage	13	13	19%
Technical errors	12	12	18%
Improper choice of prosthesis (4)			
Improper placement of prosthesis (2)			
Fracture of the femur (6)			
Early postoperative complications	43	33	50%
Dislocations (11)			
Infections (12)			
Hemorrhage and shock (5)			
Decubitus ulcers (5)			
Mental disturbances (4)			
Perioheral nerve damage (3)			
Delayed union of greater trochanter (2)			
Thrombophlebitis (1)			
Late postoperative complications	34	28	40%
Paracapsular calcification (19)			
Varus migration of prosthesis (7)			
Acetabular erosion with superior or central migration (6)			
Fracture of the prosthesis (1)			
Erosion of calcar femorale with intramedullary migration (1)			
114 Complications and deaths occurred in 53 patients			

(Reprinted with permission and ©Lippincott Williams and Wilkins from Mendelsohn H, Becker BN. Complications in replacement arthroplasty of the hip; experiences with 68 additional cases. *Clin Orthop Relat Res*. 1955;6:48–53.)

50 Years Ago in CORR

femur of a patient with a spontaneous joint fusion, and by moving the osteotomy site created a mobile yet stable pseudarthrosis [2]. However, subsequent investigators in the late 1800s and early 1900s used an innovative array of approaches, primarily by inserting foreign materials between the joint surfaces [1, 7]. Smith-Petersen introduced the use a Vitallium cup between the acetabulum and femoral head in the 1930s, undoubtedly achieved greater success than earlier investigators [8, 9]. Perhaps the first attempt to actually replace

both joint surfaces was that of Theodor Gluck, who in 1894 described his efforts to fashion joint surfaces from ivory [7], but he reported no followup. Later authors, including Moore [6] and Thompson [10] used metal to replace only one side of the joint (hemiarthroplasty). The earliest successful attempts to replace both sides of the joint were reported by Charnley in 1961 [3] and McKee and Watson-Farrar in 1965 [11]. All reported complications, including those reported by Charnley: the disastrous wear of Teflon as a

bearing material [4] and high infection rates [5].

Mendelsohn and Becker reported high complication rates using hemiarthroplasty, including deaths in 12 of 66 patients (18%) (Table 2). One hundred fourteen other mostly major complications occurred in 53 of the 66 patients. These included migration and erosion of bone (Fig. 5). They concluded, "It is not our intention to evaluate preoperative indications, but, in view of the dismal picture portrayed by this statistical survey, it is our strong clinical impression that this operation should

Fig. 5 Eicher prosthesis. (Left) Three months after operation. The prosthetic head has migrated superiorly and does not articulate with the acetabular fossa. (Right) Twenty-one months later, showing creation of a secondary acetabular fossa with progressive superior migration and bony erosion. (Reprinted with permission and ©Lippincott Williams and Wilkins from Mendelsohn H, Becker BN. Complications in replacement arthroplasty of the hip; experiences with 68 additional cases. *Clin Orthop Relat Res.* 1955;6:48–53.)

50 Years Ago in CORR

be regarded as a procedure of last resort for carefully selected patients in the older-age group.” All of these early pioneers and users of these various sorts of approaches had high complication rates. Had they not persisted, we would not have today what is undoubtedly one of the most effective operations ever developed for relieving pain and restoring function: total hip arthroplasty has relieved and enhanced the quality of life for millions of patients worldwide. If complications occur far less commonly today, and if the very large majority of patients (over 90%) retain excellent function for ten years or more, complications for those unfortunate few who develop them remain a major challenge for the patients and for their doctors.

Richard A. Brand MD
Editor-in-Chief
*Clinical Orthopaedics
and Related Research*

References

1. Allison N, Brooks B. Symposium on Arthroplasty: Arthroplasty: Experimental and Clinical Methods. *J Bone Joint Surg Am.* 1918;s2-16:83–93.
2. Barton JR. The classic. On the treatment of ankylosis by the formation of artificial joints John Rhea Barton. *Clin Orthop Relat Res.* 1976; 2–11.
3. Charnley J. Arthroplasty of the hip. A new operation. *Lancet.* 1961;1: 1129–1132.
4. Charnley J. Using Teflon in arthroplasty of the hip-joint. *J Bone Joint Surg Am.* 1966;48:819.
5. Charnley J. A clean-air operating enclosure. *Br J Surg.* 1964;51:202–205.
6. Moore AT. Metal hip joint; a new self-locking vitallium prosthesis. *South Med J.* 1952;45:1015–1019.
7. Peltier L. *Orthopedics: A History and Iconography.* San Francisco: Norman Publishing; 1993.
8. Smith-Petersen M. The Classic: Evolution of mould arthroplasty of the hip joint. 1948. *Clin Orthop Relat Res.* 2006;453:17–21.
9. Smith-Petersen MN. Arthroplasty of the hip: a new method. *J Bone Joint Surg Am.* 1939;21:269–288.
10. Thompson TC. Results with the use of replacement prosthesis in osteoarthritis of the hip. *Bull Acad Med N J.* 1961;7:344–348.
11. Watson-Farrar J. The prosthetic replacement of arthritic hips by means of the McKee-Farrar artificial hip joint. *Acta Orthop Belg.* 1965;31: 681–691.

50 Years Ago in CORR:

Complications in Replacement Arthroplasty of the Hip; Experience with 68 Additional Cases
Howard Mendelsohn, MD
and Bernard N. Becker, MD

Richard A. Brand MD