50 Years Ago in CORR

Arthrodesis of the Knee Joint

F. H. Moore and I. S. Smillie CORR;13:215–221

This month's symposium is devoted to papers presented at the closed and open meetings of The Knee Society during the past year. All but one of those papers relate to total knee arthroplasty in one way or another. Given the overwhelming preponderance of knee degeneration as a cause of pain and disability in older adults compared to other knee afflictions, total knee arthroplasty now dominates all surgical discussions about adult knee reconstruction. Shortly after its introduction in the early 1970s, it replaced virtually all other forms of reconstruction. However, for many disabled patients, surgeons prior to that time had to determine which of a number of far less reliable and more disadvantageous procedures to recommend, if any. In the Classic Article in this month's issue we highlight an exploration of this dilemma with a paper from 1918 exploring the various forms of arthroplasty available at the time [1]. Allison and Brooks concluded: "...it is to be emphasized that the results of all known operative methods for the relief of joint ankylosis are at best most often unsatisfactory. In general the hip, elbow and jaw results are fairly good. The results of arthroplasties on the knee joint are the least satisfactory. Every patient should, previous to operation, be clearly and frankly as possible told of the impossibility of restoration of complete normal joint

function, and that the most he can hope for is improvement after a long and tedious treatment."

Another alternative, arthrodesis, was made more reliable in the 1930s and 40s by the introduction of external devices intended to compress the adjacent surfaces [2, 3]. Moore and Smillie in their article, "Arthrodesis of the Knee Joint" [4], reviewed the outcomes of 126 patients with

rheumatoid arthritis, tuberculosis, osteoarthritis, and other miscellaneous conditions who had arthrodesis by several methods. Interestingly, 65 of the 126 patients (52%) had rheumatoid arthritis. These days surgeons only uncommonly see end-stage disease in patients with rheumatoid arthritis owing to the dramatically improved medical treatment. Twenty four of the 126 patients (19%) had tuberculosis,

Fig. 1 (Reprinted with permission from Moore FH, Smillie IS. Arthrodesis of the knee joint. *Clin Orthop Relat Res.* 1959;13:215–221.)

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another disease we rarely see in industrialized countries today. Only 15 of the 126 patients (12%) had primary or secondary osteoarthritis, the predominant diagnosis for which arthroplasty is performed today.

Moore and Smillie described three general types of fixation: a massive graft followed by spica casting, fixation pins, and compression by external fixation. All fusions except one ultimately healed after the first procedure,

although they noted a tendency for faster healing with the introduction of compression fixation (Fig. 1; Table 2). One of the problems with arthrodesis was determining the best position, and even when one planned a particular position of the fusion, it could not always be achieved. Further, they noted 12 patients were known to have had a subsequent fracture directly attributable to the operation. Thus, even with a successful fusion one could not ensure there would not be subsequent complications. Moore and Smillie did not evaluate the level of function of these patients, although the patients do have substantial limitations, and they did not assess the long-term outcomes.

Clearly, since the 1950s medical treatments have radically altered the distribution of patients for whom knee reconstruction would be considered, and total knee arthroplasty has dramatically improved the long-term

functional outcomes patients can expect.

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Table 2. Fusion time

Type of operation	Number of cases	Average time for fusion
Bone graft	49	21 weeks
Crossed pins	31*	19 weeks
Compression	35	14 weeks

* There were no operative deaths. One patient who suffered a hemiplegia and died 9 days after operation is not included. (Reprinted with permission from Moore FH, Smillie IS. Arthrodesis of the knee joint. *Clin Orthop Relat Res.* 1959;13:215–221.)

References

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