Total knee arthroplasty for the stiff knee

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Definition
A stiff knee can be defined as a knee with less than 50° range of motion, but there is a wide variation in presentation (1, 9).

An ankylosed knee can be defined as a knee with a fixed preoperative range of motion of 0° (2), resulting from the spontaneous evolution of various pathological knee conditions.

An arthrodesed knee is a knee with fixed preoperative range of motion of 0°, resulting from previous intentional surgical fusion of the knee.

Etiology
The most common causes are osteoarthritis and rheumatoid arthritis.

Ankylosis may also result from hemophilic arthropathy or psoriatic arthritis.

Previous infection of the knee or previous injury to the knee are also involved.

Some knee arthrodesis have been indicated for neuromuscular disorder or severe pain in young adults.

Previous surgery of the knee (fig. 1) is frequently found as a source of stiffness including: arthrotomy, osteotomy, or previously failed knee arthroplasty usually for infection (3, 11).

Indications
The underlying cause of stiffness of the knee must be carefully evaluated when considering the risks and benefits of the procedure, which

Fig. 1 – Lateral view of an ankylosed knee following recurrent infection in a multi-operated 46-year old patient.
is always difficult and a potential source of complications. Although there is always difficulty in determining which complications are related directly to an ankylosed or stiff knee, and which are related to the patient’s underlying disease, some conditions should discourage the surgeon to perform the arthroplasty (7). This includes: reflex sympathetic dystrophy, poor neuromuscular conditions, inadequate bone quality, low-grade sepsis and painless successfully arthrodesed knee. It should be stated at this point that cases of primary knee fusion have not been found to present the same degree of long-term complications of back pain that are associated with successful hip fusion (3, 11). When all these contraindications are eliminated, total knee arthroplasty for a stiff or ankylosed knee may be considered to relief pain, improve range of motion and provide better walking and day-living ability.

**Preoperative evaluation**

The clinical evaluation must assess the preoperative range of motion, the knee may be ankylosed in extension or with a flexion contracture. Any previous scar incision must be recorded and located as well as the state of the extensor mechanism like fibrosis of the quadriceps muscle and shortening or tightness of the collateral ligaments.

The radiographic evaluation should include full weight bearing view of the two limbs (fig. 2) to assess mechanical axis and identify intra-or extra-articular deformity, fibrosis or bony blocks. The planing also include anteroposterior, lateral and when possible patellofemoral views. Stress X-rays, whenever

![Fig. 2 – Full weight bearing view of the limbs (fig. 2a) showing an important varus deformity (24°) in a 66-year-old patient with an osteoarthritic stiff knee, showed on a lateral view (fig. 2b), under a previous total hip arthroplasty following hip fusion.](image-url)