

Rotating knee prosthesis

Surface or hinge replacement?

Until the early 1990's our experience in Total Knee Replacement (TKR) was based on AGC 2000, Tricon M and MG implants. Starting from 1992 we decided to use a rotating knee prosthesis. At that time in Italy there were many knee replacement devices with rotating elements: Oxford, LCS, Rotaglide and Endomodel from Link. The Endomodel rotating prosthesis was our choice and between 1992 and 1995 we implanted 142 prosthesis of this type, 128 as primary replacement and 14 as TKR revision. The overall results were good or excellent in most of our cases (Fig. 1). During this period we had 6 dislocations of the device (Fig. 2) and 4 infections: 1 from our service and 3 coming from other hospitals.

Endomodel revision surgery is not an easy job! The prosthesis has long cemented stems. All the cement must be removed and as much bone stock as possible must be saved.

Because of the difficulties which arose in Endomodel revision surgery we thought about the real need of rotating devices in TKR and if endomodel was the right choice.

In 1971 Kapandji demonstrated that the natural "screw home movement" of the knee is the result of anatomical and functional factors.

The anatomical factors are:

- ▶ the polycentric curvature of the femoral condyles,
- ▶ the different shape of the medial and lateral tibial plateau,
- ▶ the different position of the collateral ligaments.

The functional factors are directly correlated to the prevalent strength of the internal rotator muscles related to the external rotators.

Bearing in mind these considerations we decided to investigate who would really benefit from rotating prosthesis.

Biologically aged patients with severe axial deformity, damaged joint components and muscle atrophy, would not really benefit from rotating prosthesis because the physiological screw home movement is not significant.

When choosing a total knee replacement the surgical goals for these less active patients with poor kinematics



Fig. 1 ▲ See text

are pain relief and a continuing good age-related life style. As confirmed by the current excellent long-term results a normal TKR is sufficient to allow a good age-related life style in these cases.

Rotating knee prosthesis could be useful in younger and more active pa-

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Fig. 2 ▲ See text



Fig. 3 ▲ See text

tients with a mild axial deformity, preserved collateral ligaments and good muscles. In these cases the screw home movement is still possible. Younger,

more active and high demanding patients with better kinematics may have more problems of polyethylene wear and tibial component loosening at long term. For this reason the surgical goals in these cases should be:

- ▶ guarantee high performance
- ▶ maintain existing kinematics
- ▶ decrease prosthesis wear
- ▶ preserve as much bone stock as possible in order to facilitate eventual age related revision surgery of these high demanding patients.

Conclusion

In our opinion a rotating hinged prosthesis as Endomodel is not the best solution for the long cemented stems. As revision surgery is often required, so much cement in the diaphyseal canal which must be removed can create problems. Rotating surface prosthesis, by comparison, do usually not have stems



Fig. 5 ▲ See text

but thin components and can be implanted with very few cement.

For this reason we have been using ZIMMER's "Mobile Bearing Knee" prosthesis for 1 year in younger active patients. Until now statistics are limited and it is still too early for a follow-up (Fig. 3).

Nevertheless the Endomodel prosthesis can still be considered as "gold standard" in primary TKR in the case of serious axial deformity, collateral ligament deficiency and in rheumatoid patients with soft tissue and muscular atrophy or in prosthesis revision surgery (Fig. 4 and 5).



Fig. 4 ▲ See text