ABSTRACT

The implant includes an annular sector having a guide groove for implanting in the femur and a slidable member for implanting in the patella which member has a manner of arcuate shape for sliding in the guide groove of the annular sector. The runner also has a raised projection to provide for tilting movements of the patella. The slidable member is asymmetrical about a central plane so as to provide for two different implant positions.

6 Claims, 6 Drawing Figures
PHOSTHETIC PATELLA IMPLANT

This invention relates to a prosthetic patella implant for guiding a patella on a femur.

As is known, pathological changes of the cartilaginous and/or bony tissue on which the patella moves relative to the femur lead to painful alterations which greatly impair a patient’s ability to walk.

Accordingly, it is an object of the invention to provide a prosthetic implant which can replace such tissue and which provides at least considerable restoration of the patient’s ability to walk.

Briefly, the invention provides a prosthetic implant for guiding a patella on a femur which includes an annular sector for implanting in the femur and a member for implanting in the patella. The annular sector has a guide groove in an arcuate peripheral surface while the other member has a runner mounted in raised relation on a peripheral surface for sliding in the guide groove. The runner which can also be in the form of a skid or guide is of complementary shape to the shape of the guide groove to facilitate sliding.

Advantageously, one of the two parts of the prosthesis is made of a plastics, e.g. polyethylene, which is compatible with the human organism, while the other part is made of one of the known metal alloys used for prosthetic implant. Both parts can, of course, be made of metal, in which event, as another variant, one of the two parts may be plastics coated. Alternatively, both parts can be made from appropriate plastics, e.g. polyethylene or a polyester.

Preferably, the runner can be disposed on the periphery of a circle segment of a cylindrical disc. In order to provide some range of adaptation of the prosthesis to the individual circumstances of each patient, the circle segment of the disc is asymmetrical relative to the perpendicular passing through the center of its base. The advantage of this feature is that the prosthesis can be fitted in the patella in two different positions 180° apart from one another, the runner having more curvature in one of these positions than in the other.

In order to provide a simple way of securing the sliding member in the patella, the sliding member can be pinned therein by means of two pins. In this case, and if the sliding member is embodied as a circle segment, the pins can each be at least substantially the same distance from the outermost boundary of the segment as measured in a direction parallel to the base.

These and other objects and advantages of the invention will become more apparent from the following detailed description and appended claims taken in conjunction with the accompanying drawings in which:

FIG. 1 diagrammatically illustrates a front elevational view of an annular sector formed with a guide groove and inserted in a femur in accordance with the invention;

FIG. 2 diagrammatically illustrates a side elevational view of the sector of FIG. 1 in a femur;

FIG. 3 illustrates a view taken on line III—III of FIG. 2, the bone which surrounds the sector having being omitted;

FIG. 4 illustrates a side elevation of a circular disc and an arcuate segment which is cut out to form a sliding member according to the invention;

FIG. 5 illustrates a side elevational view of the finished arcuate segment; and

FIG. 6 illustrates a diagrammatic plan view of an arcuate segment after being fitted into a patella.

Referring to FIGS. 1 and 3, a guiding groove 1, shown in approximately normal size, is disposed in an annular or arcuate sector 2 comprising a rim-like disc and representing a cut-out of approximately one-third of a complete circle (about 105°). The sector 2 includes side flanks 3, 4 which are formed with projections and recesses (not shown) for improved anchorage, provided basically by a bone cement, e.g. methyl methacrylate, in a previously operated-on femur 5. The sector 2 is made of a plastics, such as polyethylene or a polyester, which is compatible with and resistant to the human organism and at least substantially non-abrading.

Referring to FIGS. 5 and 6, a sliding member 7, which is shown in normal size, is adapted to be anchored in a patella 6. The member 7 has a runner or skid or guide or the like 8 on the periphery which is raised and which is adapted in shape to the groove 1. As shown, the member 7 is in the form of a circle segment which is cut from a cylindrical disc 9 in the manner shown in FIG. 4. The segment 7 has an angular cut-out less than that of the sector 2, by way of example, about 93° in one existing prosthesis as compared with the 105° of the sector 2. As FIG. 4 also shows, the segment 7 projects from the disc 9 to be asymmetrical of a perpendicular 10 to the center of the base 11. Because of this, there are various possibilities for positioning and curvature of the member 8 in the patella 9 by turning the segment 7 through 30°. In one case, when the joint bends relatively to the femur 5, the patella 6 describes one particular curve, while in the other case, the patella 6 describes a different curve. The prosthesis can therefore be adapted to some extent to the requirements of individual patients.

In order to secure the member 7 in the patella 6, the member 7 has pins 12 which are introduced into the base 11 and rigidly anchored therein, e.g. by welding or brazing. These pins 12 are introduced into corresponding passages in the patella 6, which has also been formed with a recess adapted to the shape of the member 7, and fixed by a bone cement. If the pins 12 are at least approximately disposed to be at the same distance a from the outermost edge of the segment 7 as measured in a direction parallel to the base 11, the rotation of the segment 7 just described can readily be performed during the fitting operation if necessary or in a subsequent correcting operation, without having to contrive new passages in the patella 6 to receive the pins 12.

In order to allow some provision for tilting movements of the patella 6 which is guided by the member 7 in the groove 1, the runner 8 has a button-like projection 13 approximately at the center of its arc. This projection 13 is, conveniently, embodied as a pin having a part-spherical head. Such a pin can be produced independently of the member 7 and can be subsequently pressed into an appropriate passage in the member 7.

As already mentioned, the member 7 and the projection 13 can be made of one of the known metal alloys suitable for prosthetic implants, thus ensuring, if the groove 1 is of plastics or is plastics-coated, the satisfactory sliding properties of metal on a plastic surface.

What is claimed is:

1. A prosthetic implant for guiding a patella on a femur comprising
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3. An annular sector for implanting in a femur, said sector having a guide groove in an arcuate peripheral surface thereof; and
a member for implanting in a patella, said member having a runner mounted in raised relation on a peripheral surface thereof, said runner being shaped in complementary relation to said guide groove and being slidingly received in said guide groove.

2. A prosthetic implant as set forth in claim 1 wherein said runner has an arcuately shaped periphery.

3. A prosthetic implant as set forth in claim 2 wherein said member has a flat base and is asymmetrical relative to a perpendicular plane to said base and passing through the center of said base.

4. A prosthetic implant as set forth in claim 1 wherein said member includes a base and a pair of pins in said base for pinning said member in the patella.

5. A prosthetic implant as set forth in claim 4 wherein each pin is spaced from an adjacent outermost boundary of said member the same distance as the other pin from the other boundary as measured in a direction parallel to said base.

6. A prosthetic implant as set forth in claim 1 wherein said member has a part-spherical projection projecting outwardly from said runner for sliding in said guide groove of said sector.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,806,961 Dated April 30, 1974

Inventor(s) Maurice E. Müller

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the title page of the patent, insert the following:

--This application is based on Swiss Patent Application No. 2233/72 filed February 16, 1972, to which the right of priority is claimed.--

Signed and sealed this 4th day of February 1975.

(SEAL)
Attest:

McCOY M. GIBSON JR. C. MARSHALL DANN
Attesting Officer Commissioner of Patents