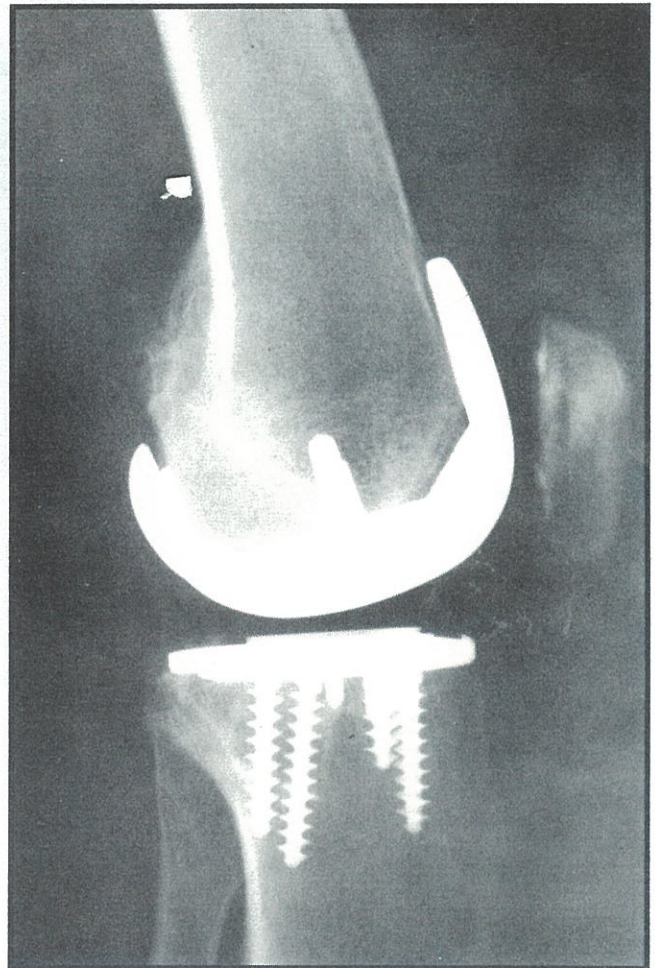
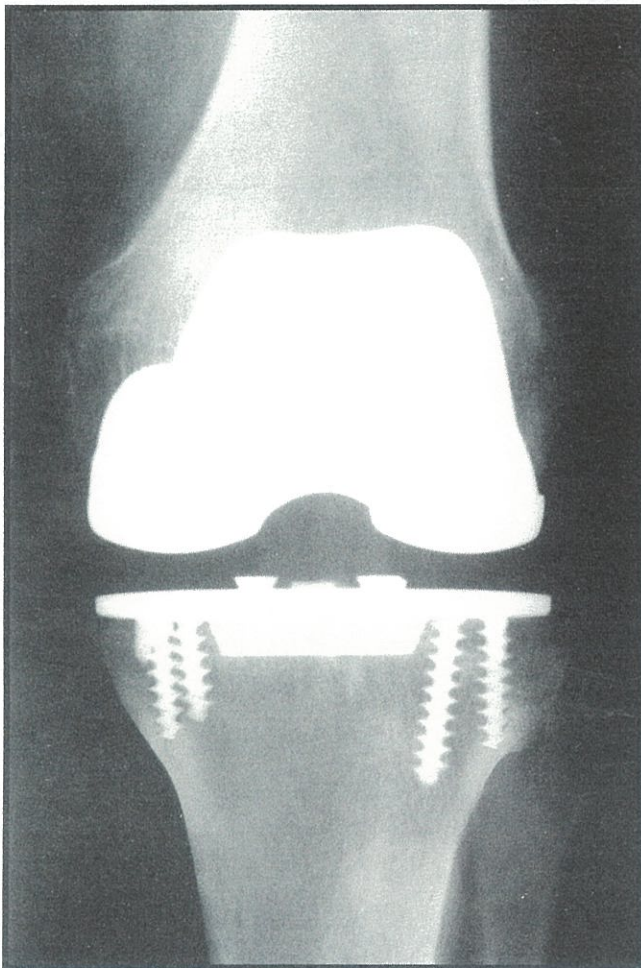


BioPRO

EQUALIZER MODULAR TOTAL KNEE REPLACEMENT

TECHNIQUE BY:

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EQUALIZER MODULAR TOTAL KNEE REPLACEMENT

SURGICAL PROCEDURE

JAMES W. PRITCHETT, M.D.

Whereas a total hip replacement is primarily a bony operation, a total knee replacement is primarily a soft tissue operation. Excellent skin cover and an intact joint capsule are necessary. The fact remains that infection is the most common cause of failure. Therefore, planning incisions and a tension-free wound are imperative. Knee replacement must be done under broad spectrum antibiotic cover with careful technique. As much as is practical, avoid creating narrow skin bridges from old scars by utilizing old incisions. If there has been no previous surgery, or a previous scar may not be used, then it is preferable to make a midline incision.

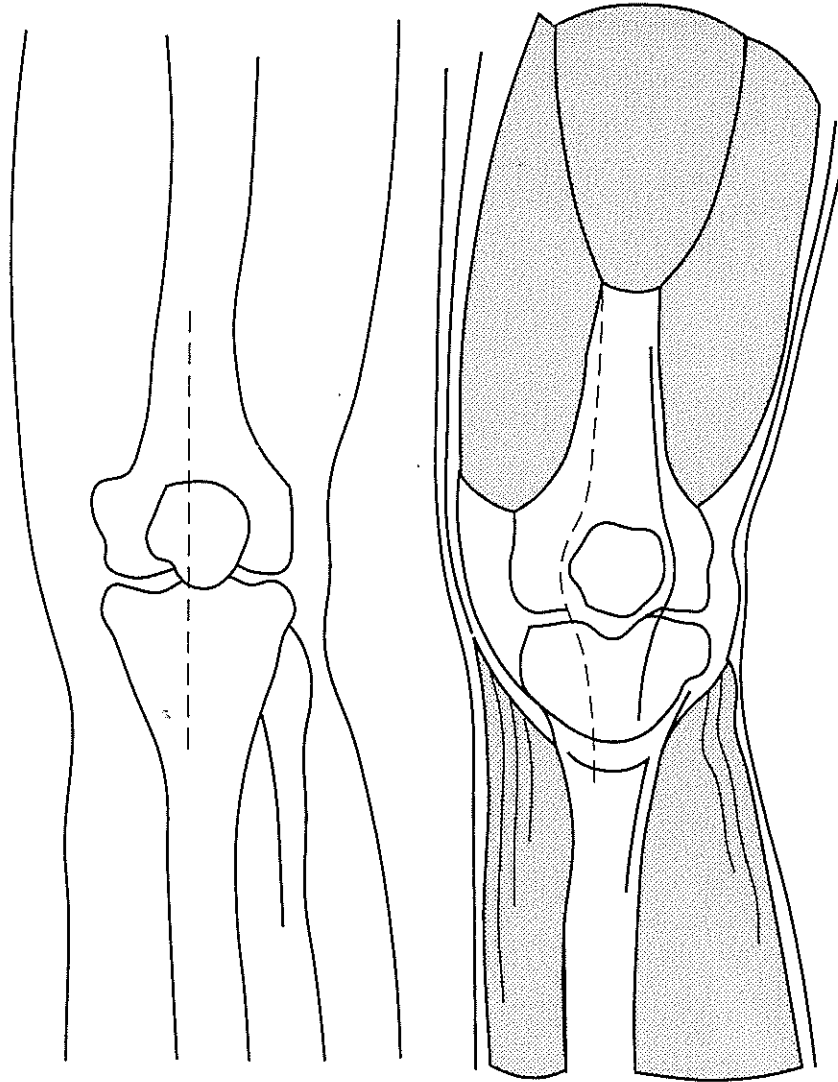
Each patient must be assessed for appropriate indications for surgery. Templates may then be applied to the x-ray to assist in prosthesis selection. If a varus deformity is present, plan on performing a medial ligamentous release from the tibia. If a valgus deformity is present, a lateral release may be required. For flexion contractures, plan on a generous distal femoral resection. Determine the wear on the tibia and femur to decide on the amount of bone resection that will be required. For the femur, if a valgus deformity exists, make the distal femoral cut in relatively less valgus usually between 3° and 5°. If a varus deformity is present, remove only 2 mm of medial tibial plateau and up to 8 mm on the lateral aspect.

Drape the leg free and apply an upper thigh tourniquet. Much, if not all of the surgery can be done without inflating the tourniquet. Secure a sandbag on the table as a footrest and check the position by flexing the knee to 90°. With the knee flexed, make the incision and enter the knee through a medial parapatellar incision. Balance the ligaments and excise necessary synovium and menisci. If the degree of deformity and bone loss is limited, the resurfacing prosthesis retaining both cruciate ligaments is preferred. For cases of significant deformity, bone loss or revision surgery, the modular prosthesis with medullary rod and central keel is preferred. The surgeon should choose the prosthesis and technique most appropriate for the individual patient.

STEP

I

EQUALIZER MODULAR TOTAL KNEE REPLACEMENT

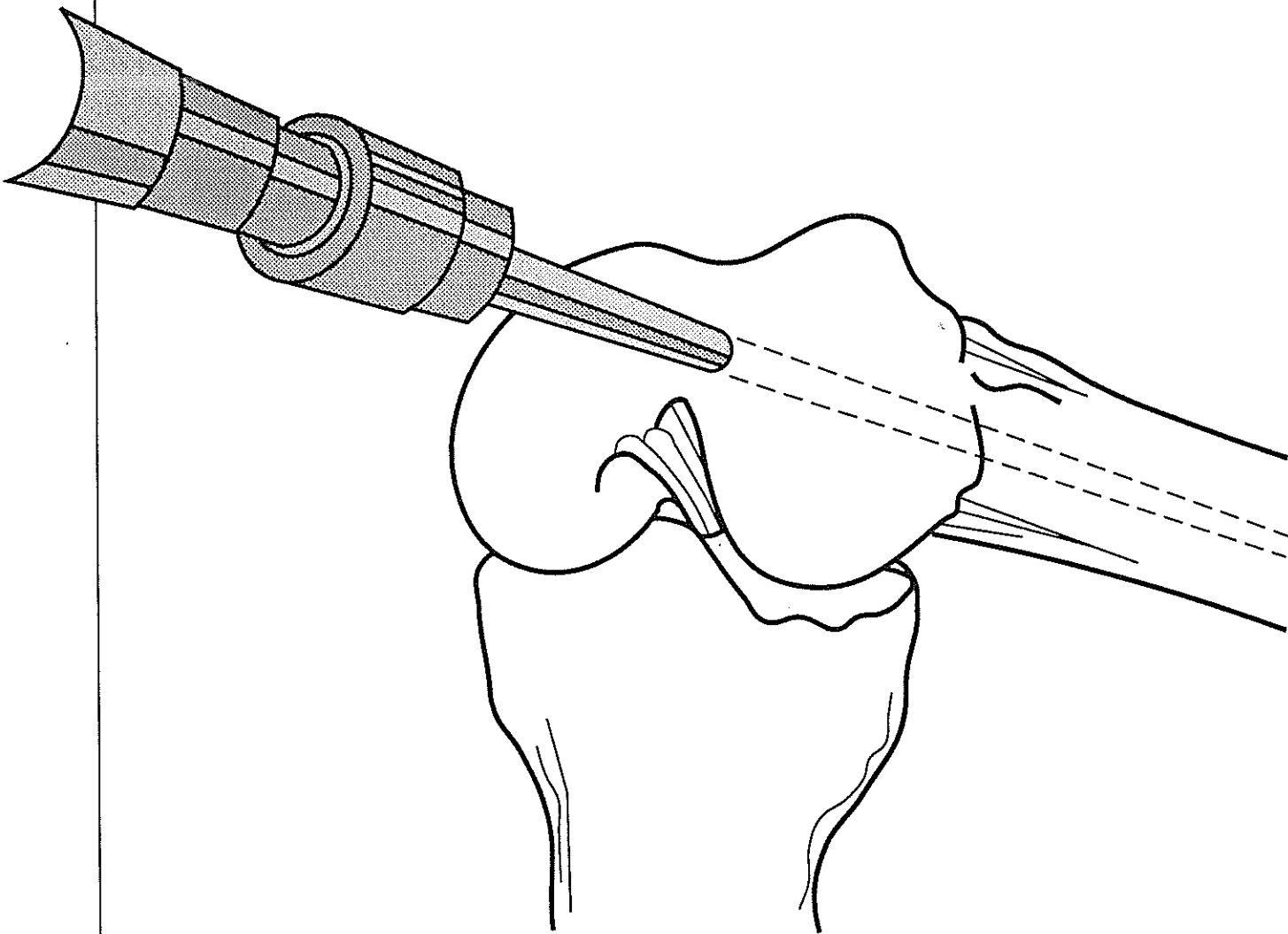


Step 1

An anterior skin incision and parapatellar arthrotomy exposing the knee.

STEP 2

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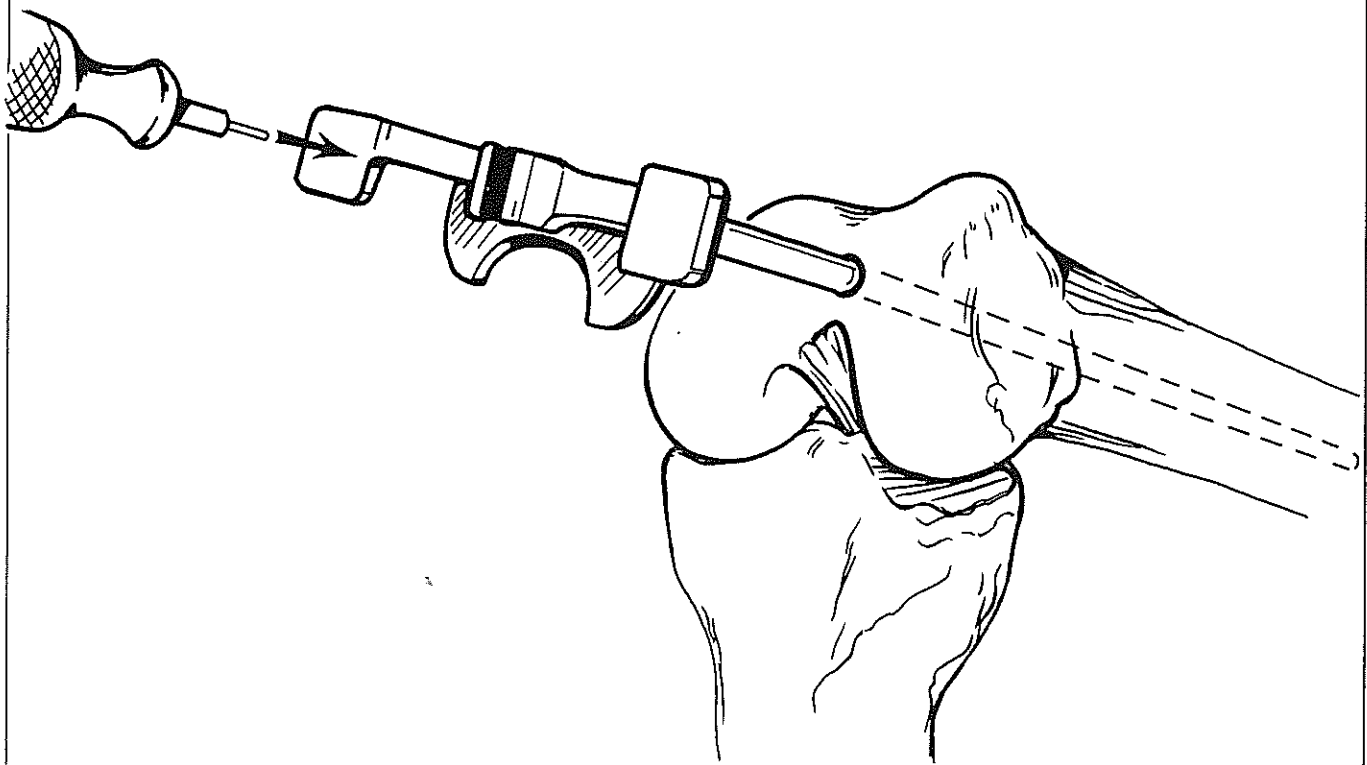


Step 2

Drill a $\frac{5}{16}$ " hole just anterior to the anterior cruciate in the midline of the femur.

STEP 3

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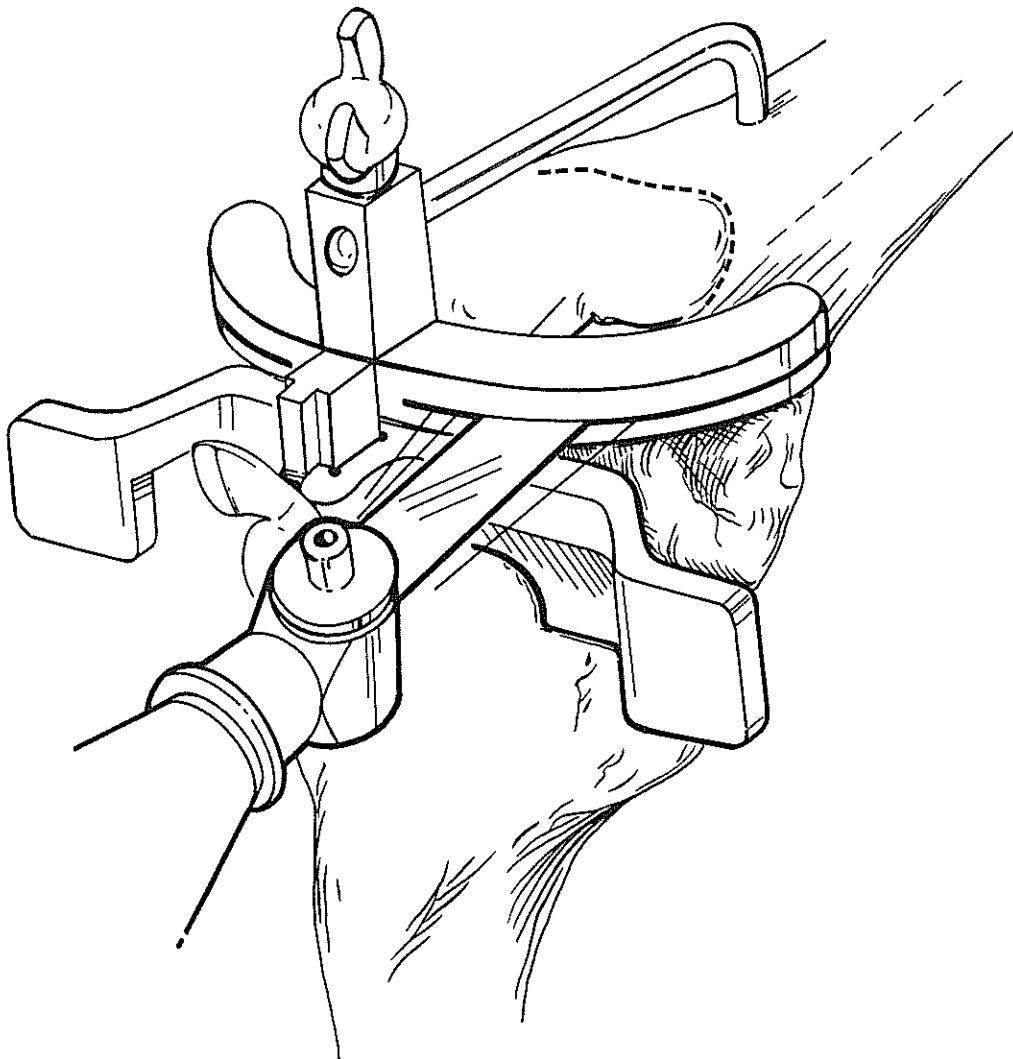


Step 3

Insert the intramedullary guide and assess rotation by visualizing the posterior femoral condyle to make sure the guide and the posterior condyles are parallel to each other. Impact the guide until the pins are seated into the most prominent condyle.

STEP 4

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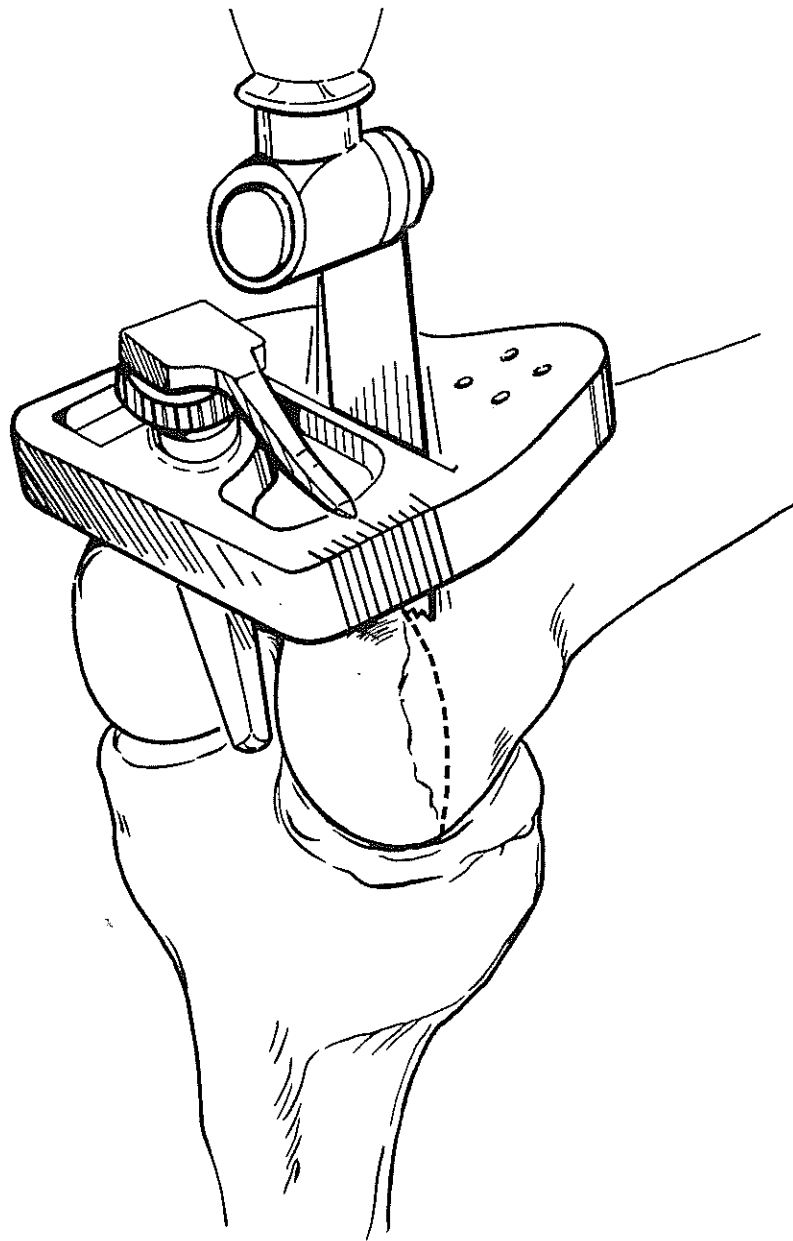


Step 4

Connect the anterior femoral cutting guide to the intramedullary guide. The stylus is positioned along the anterior cortex of the femur at a point where the lateral femoral condyle meets the distal anterior shaft of the femur. Great care must be taken to avoid creating a notch in the anterior femoral cortex. The saw blade or anterior angel wing may be used to check where this resection will be made.

STEP 5

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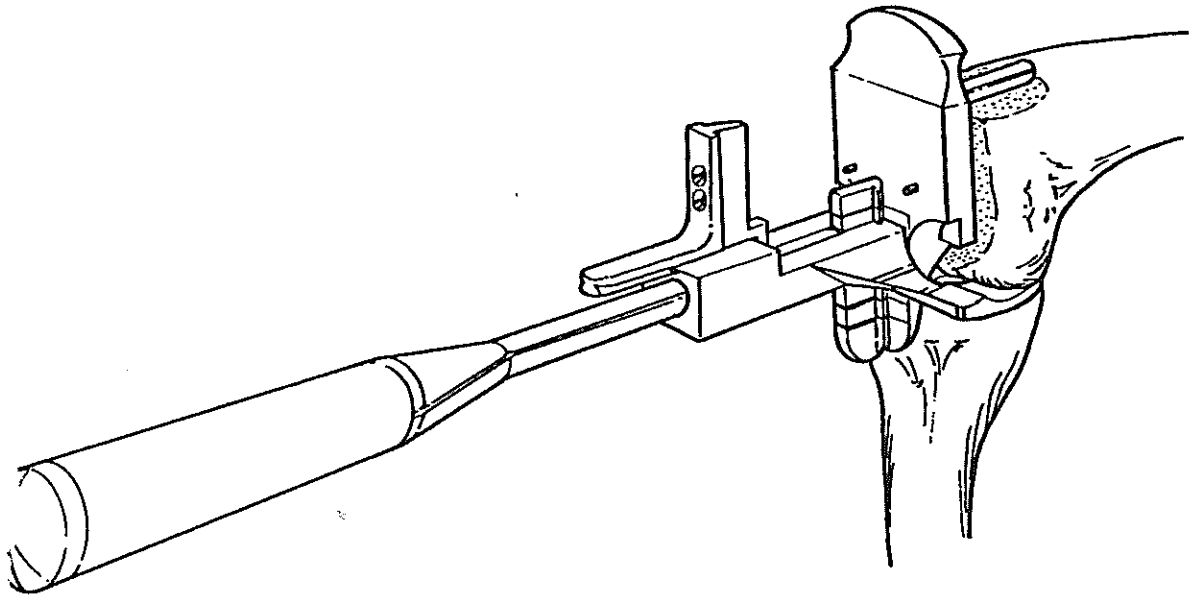


Step 5

Connect the distal femoral cutting guide to the intramedullary guide by engaging the gauge stylus through the square receptacles in both guides. The extension arm may be used at this time by placing the square end into the distal femoral cutting guide and the opposite end is then used to check proper varus valgus alignment. The gauge is then checked and a minimum of three pins are inserted into the guide for stability prior to the cut. The gauge is then removed along with the intramedullary guide. The 0, +3 or +6mm slot is then used to help the surgeon remove any flexor contraction present. The proper slot is selected and the resection is made.

STEP 6

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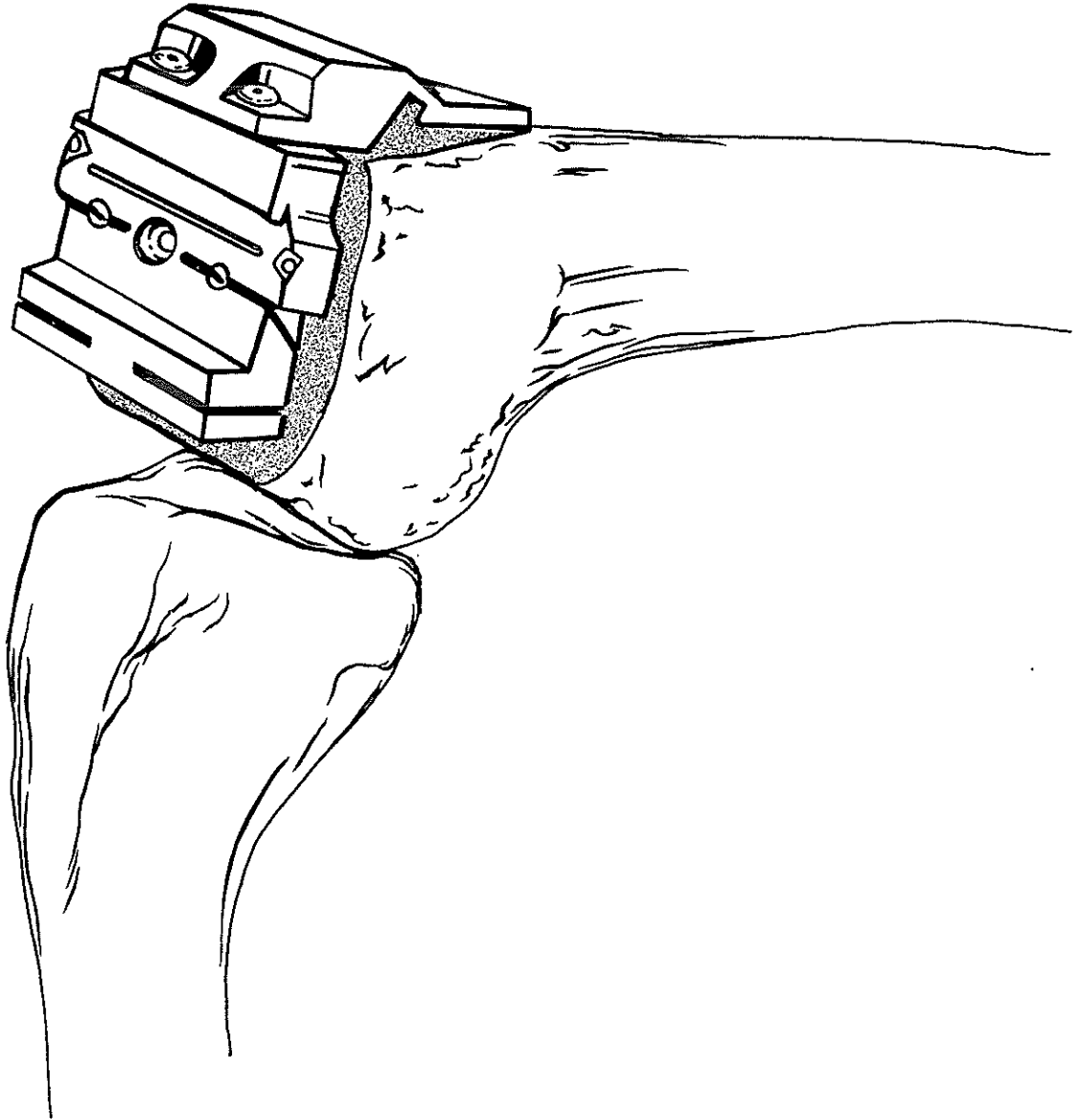


Step 6

Apply the femoral sizing guide to the distal femur and determine the correct chamfer/posterior cutting block. This is accomplished by placing the feet of the sizer under the posterior condyles and the arm on the top of the anterior cortex. Adjustment is made by turning the handle.

STEP 7

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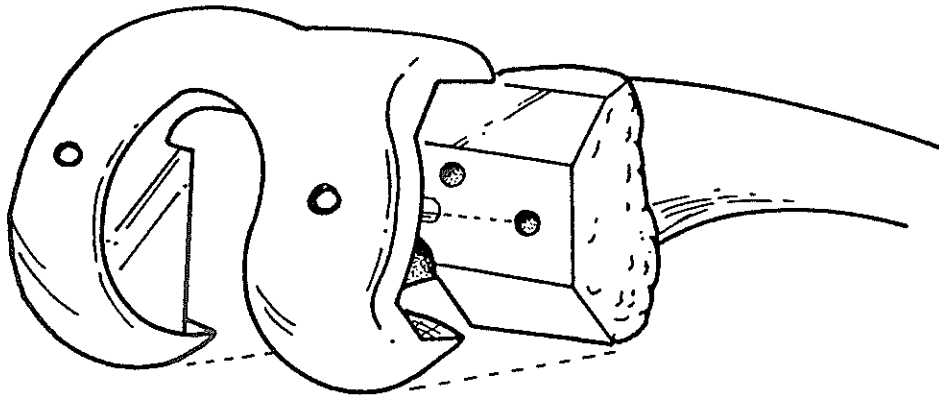


Step 7

Apply the appropriate chamfer/posterior cutting block by centering the cutting block on the anterior and distal cuts making sure the distances medially and laterally are the same in relation to the distal femoral condyles. Attach with appropriate bullet pins and stabilizing pins.

STEP 8

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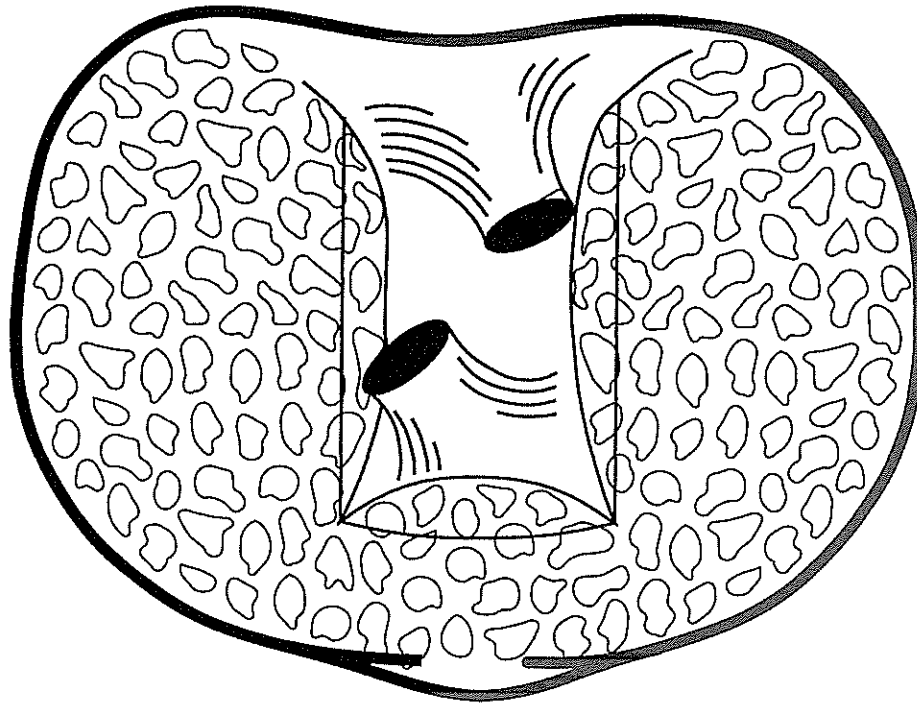


Step 8

After determining proper medial lateral positioning of the femoral trial, insert the punch into the holes of the trial for later impaction of the final femoral implant.

STEP 9

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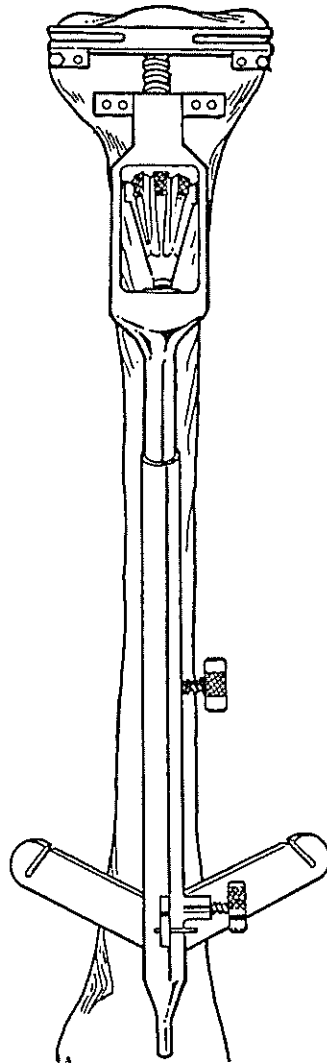
Step 9

RESURFACING PROSTHESIS WITH CRUCIATE RETENTION

Using the tibial resection guide, create an island around the tibial eminence preserving both cruciate ligaments. A reciprocating saw is used and the anterior aspect of the tibia is removed. The tibial prosthesis fits as a horseshoe.

STEP 10

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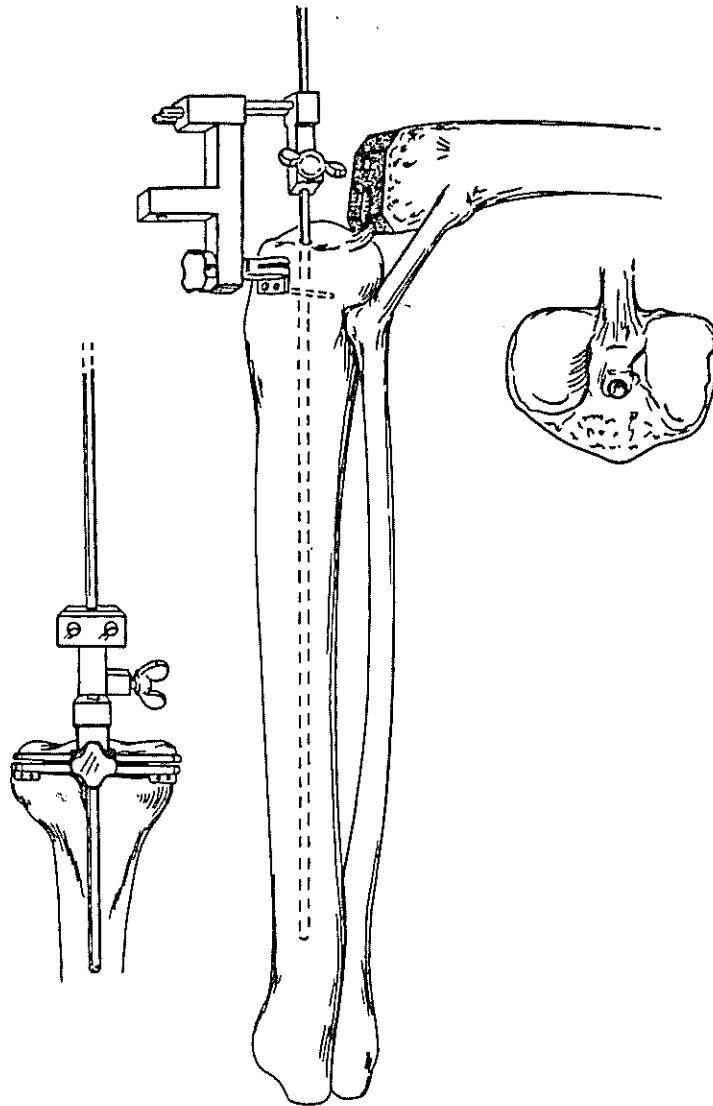


Step 10

THE EXTRAMEDULLARY GUIDE, for producing the tibial cut with 5° of posterior slope, may be used or, alternatively, the intramedullary guide may be used.

STEP II

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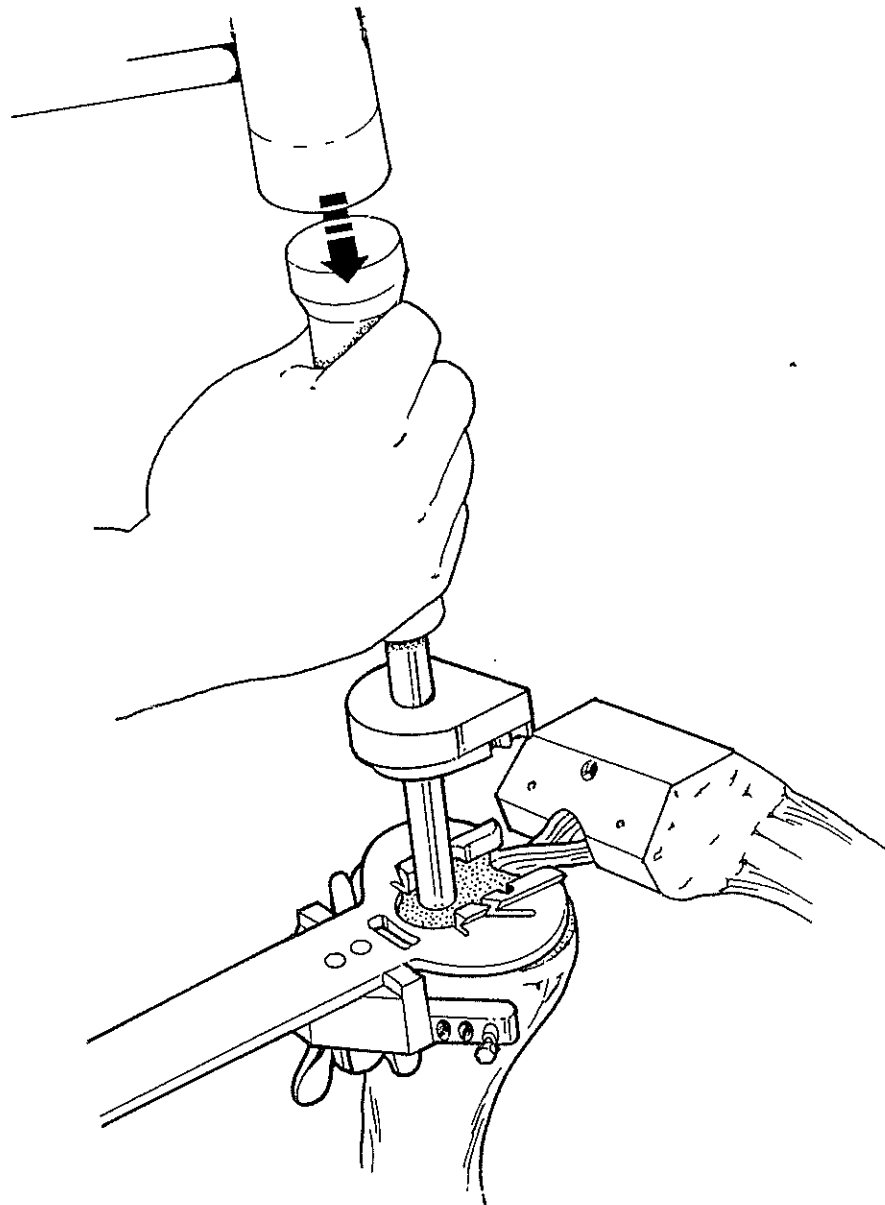
Step 11

THE INTRAMEDULLARY GUIDE. Drill a $\frac{5}{16}$ " hole in the tibia near the anterior cruciate ligament origin.

Insert the intramedullary guide into the tibia and plan to cut 2 to 8 mm of bone off the tibia depending on the deformity present. Attach the tibial cutting guide with pins and make the cuts with an oscillating saw. Preserve the posterior cruciate ligament.

STEP 12

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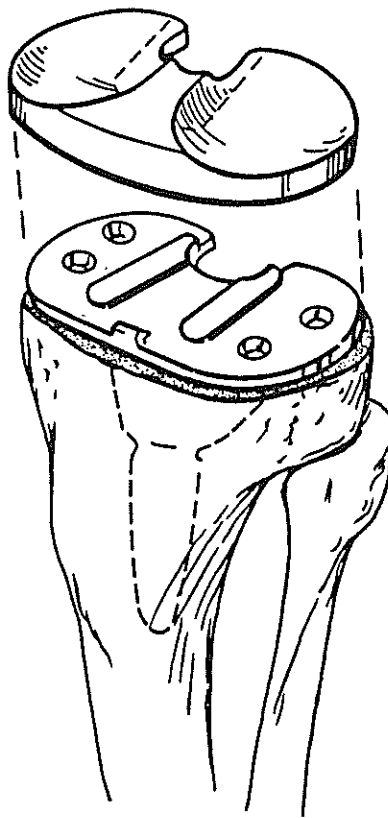


Step 12

The universal template can be attached to the tibia with anterior pins and used to make the cuts for either the resurfacing or modular tibial prosthesis. It may also be used as a trial prosthesis. The bushing may be used to create the appropriate hole for the medullary rod from 9 to 15 mm in diameter.

STEP 13

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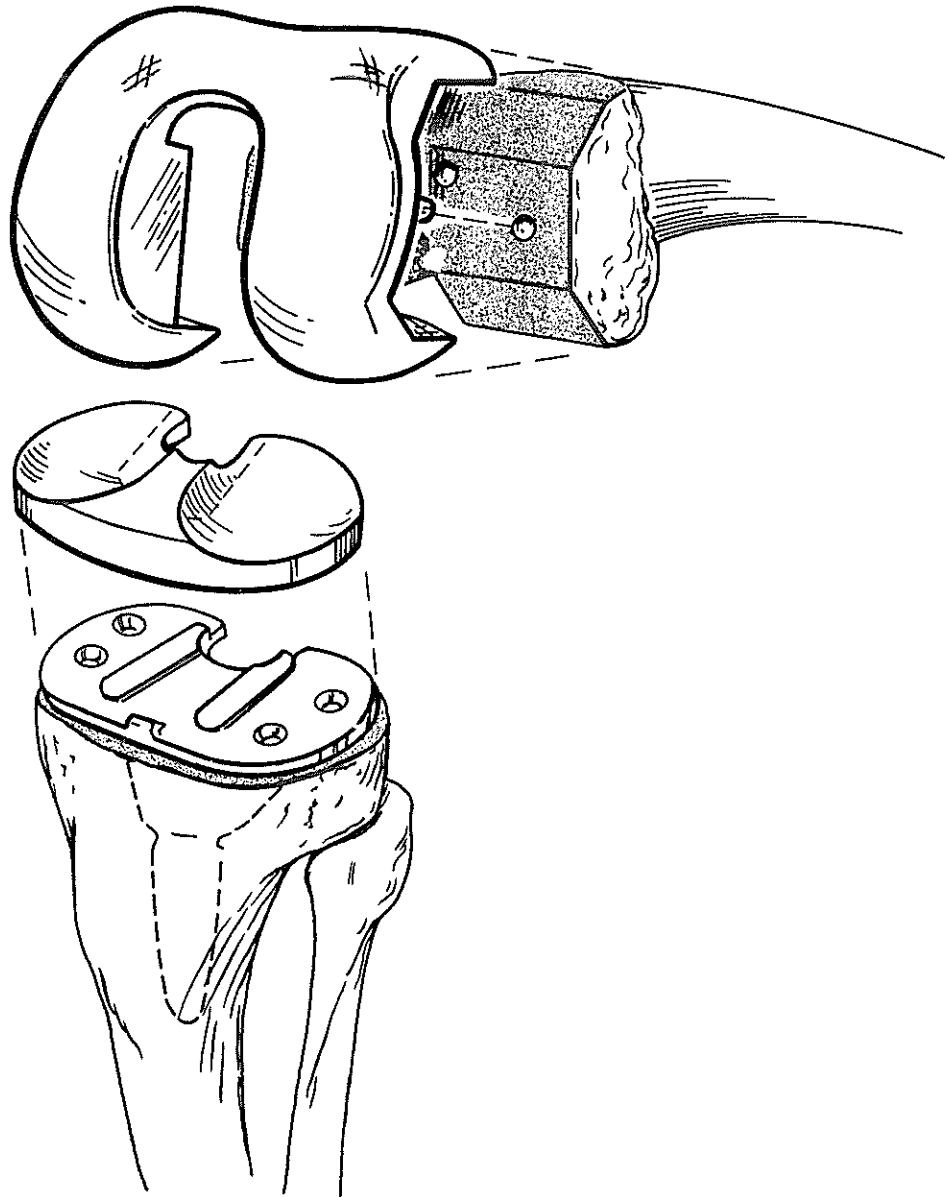
Step 13

MODULAR PROSTHESIS WITH ROD AND KEEL

Remove the template and perform a trial of the tibial tray. Drill up to four holes for supplemental screw fixation.

STEP 14

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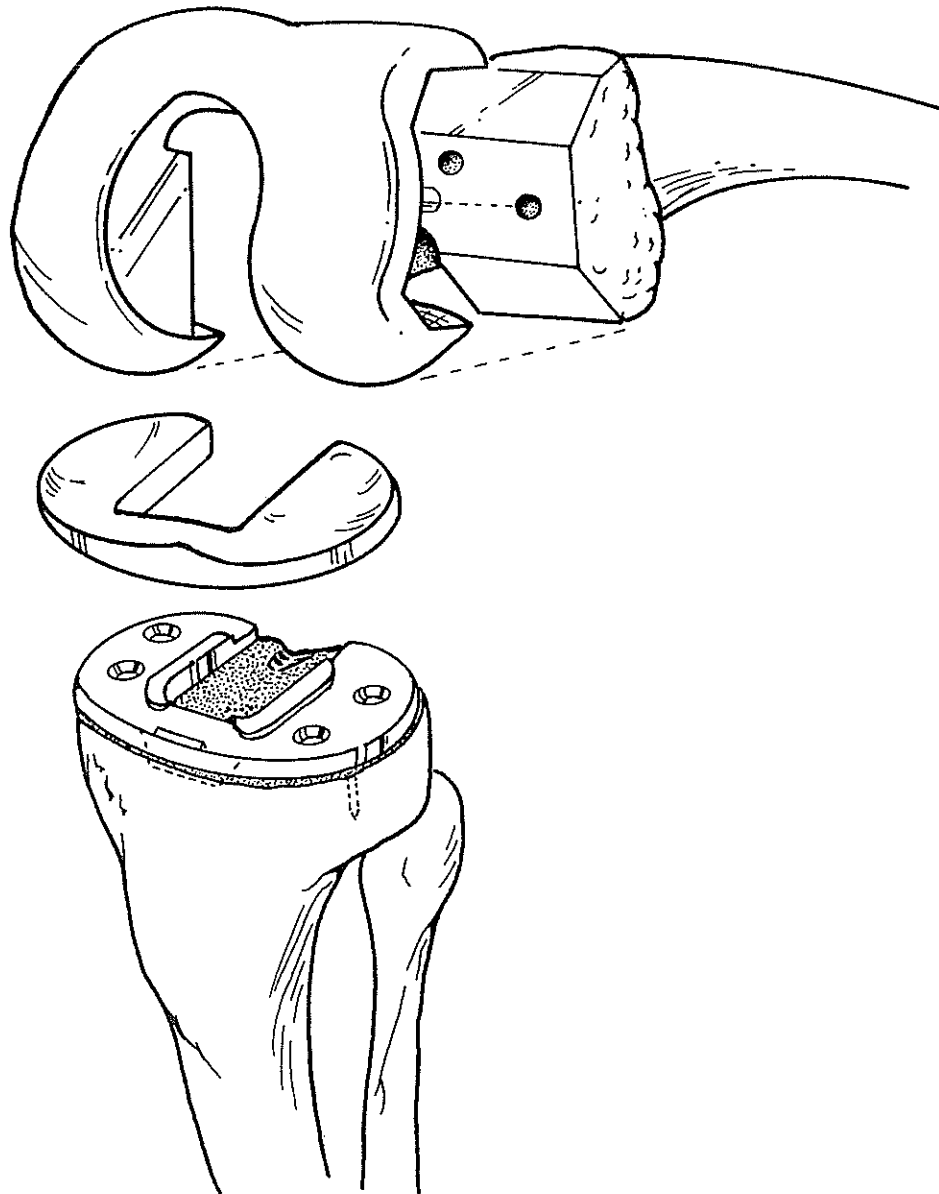


Step 14

Insert all the components on a trial basis and select the most appropriate thickness of polyethylene insert. The diameter of the polyethylene is determined by the choice of the femoral prosthesis. *Normal cementing technique is intended.*

STEP 14a

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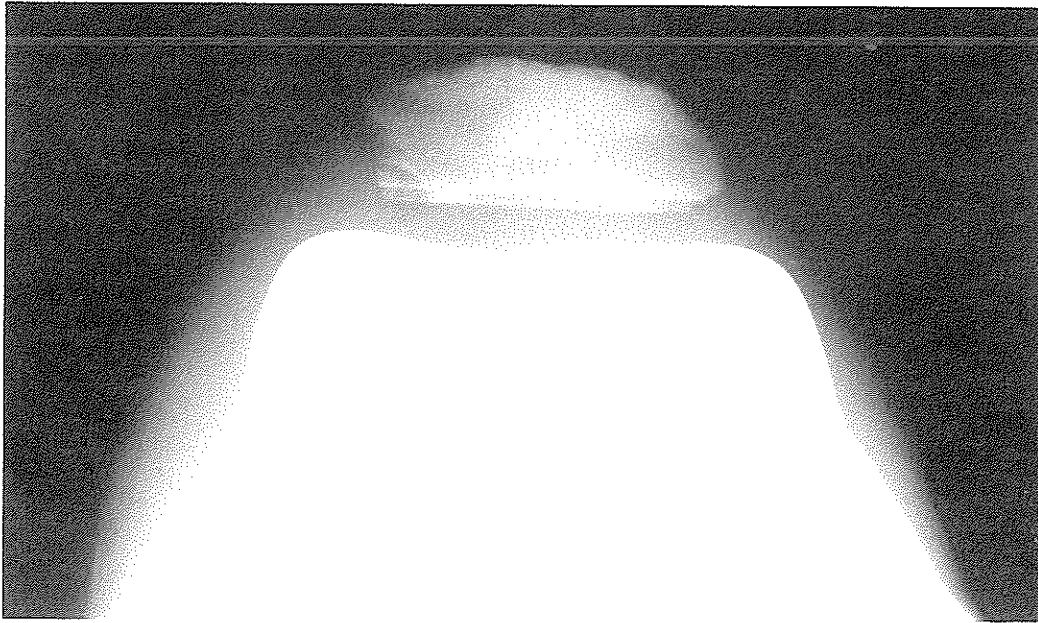


Step 14A

For the resurfacing prosthesis, a trial reduction can be performed on the template or with the femoral and tibial prosthesis in place. *Normal cementing technique is intended.*

STEP 15

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Step 15

Using the trial button as a guide, place a small drill hole in the center of the patella. Try to use a patella appropriate to the femoral component selected. For the small femoral prosthesis sizes of 62 and 66, use a 36 mm patellar button. For the medium femoral prosthesis sizes of 70 and 74, use a 40 mm patellar button. For the large sizes of 78 and 82 and 86, use a 44 mm button. Use the stop drill to enlarge the patellar central pinhole and use the patella clamp to insert the patella trial. Use a curette to undercut the patella as needed. For the porous coated cobalt chromium backed patella, three peg holes are drilled through the appropriate patellar template.

After inserting the final components, check for stability and need for a lateral retinacular release of the extensor mechanism. Confirm the component positioning with an intraoperative x-ray, if necessary; and then close in routine fashion.

Individualize the postoperative care according to the needs of the patient.

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