Replacement Joints for Fingers
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Abstract—If nonsurgical treatments are not successful in easing problems of finger arthritis, joint replacement surgery is the next step. Joint replacement surgery is a procedure of orthopedic surgery in which the dysfunctional joint surface is replaced with an orthopedic prosthesis. The modern methods today use silicone implants.

I. INTRODUCTION

In a normal joint, bones have a smooth, glistening surface made of a substance called articular cartilage on their ends that allows one bone to glide easily against another. Joints are lubricated by a thin layer of synovial fluid. When the articular cartilage wears out, or is damaged, or the joint fluid is abnormal, problems develop and joints often become stiff and painful, which is arthritis. Joint arthroplasty of the fingers can be done within a few different places of the hand. These include the proximal interphalangeal joints (PIP), metacarpal phalangeal joints (MCP), and some of the carpals of the hand.

II. METHODS

Silicone implants are used by hand surgeons primarily to replace the MCP and PIP joints. The implant, or “prosthesis” acts as a spacer to fill the gap created when the arthritic surfaces of the MCP and PIP joint are removed. To perform the replacement, the surgeon first makes an incision in the back of the hand over the joints that are being treated. Each joint that needs to be replaced is then opened so that the surgeon can see the joint surfaces. The cartilage is removed from both joint surfaces to leave two surfaces of bone. Next, a small cutting tool called a burr is used to make holes in the bones of the finger joint. The artificial finger joint has a stem on each side that is inserted into the canals created in the bone of the finger and the metacarpal joint. The operation is completed by using the tendons and ligaments around the joint to form a tight sack to hold the implant in place. The skin is sutured together and a splint is applied. Patients will probably be in a splint, brace, or cast for six weeks.

III. RESULTS

In one study, thirty patients (52 hands) all suffering from severe rheumatoid arthritis, had MCP joint implant arthroplasties in the past 4 years, with 196 implants inserted. Three patients required re-operation for fracture of the prototype implants. The rest of the patients had subsequently greatly improved functional and cosmetic appearance of the hand. The results were far superior to the previous tests with other technologies of joint arthroplasty in patients with rheumatoid arthritis.

IV. DISCUSSION

The benefits of finger joint replacement include: reducing joint pain, restoring or maintaining joint motion, improving the look and alignment of the joint(s), and improving overall hand function. Some of the risks of this surgery involve implant loosening (if fracture or wear that occurs over time may require subsequent surgery to repair or replace the damaged parts), infection, joint stiffness or pain (if the procedure or implant fails), dislocation of the artificial joint, damage to vessels, nerves or other structures in the region of the surgery.

REFERENCES


