Total Shoulder Arthroplasty

Description
Total shoulder arthroplasty (TSA) is the surgical replacement of a damaged shoulder joint with artificial components. TSA is performed to relieve pain and improve range of motion (ROM) in patients with severe destruction of the humeral head and glenoid surface (i.e., the shoulder socket) who are unresponsive to conservative therapies. Common indications for TSA are osteoarthritis, rheumatoid arthritis, osteonecrosis, and trauma.

In TSA, the head of the humerus is replaced with a metal ball prosthesis and the glenoid is replaced with a polyethylene shell. TSA can be performed under general or regional anesthesia. An incision is made from the middle of the clavicle to the middle of the humerus. Scar tissue is removed, the upper end of the humerus is cut using a saw and removed, and the humeral and glenoid components of the prosthesis are implanted with or without cement. In some cases, a drainage tube is placed to drain excess fluid from the surgical site. The patient remains hospitalized for 1–3 days after surgery.

The only absolute contraindication to TSA is active infection. Relative contraindications include recent infection, rotator cuff and deltoid dysfunction (for details, see Food for Thought, below), neuropathic arthropathy, severe brachial plexopathy, intractable shoulder instability, severe medical comorbidities, and inability/unwillingness to participate in physical therapy (PT) after surgery.

Potential Complications
Potential complications of TSA include bleeding, venous thromboembolism (VTE; i.e., deep vein thrombosis [DVT] and/or pulmonary embolism [PE]), infection, allergic reaction, shoulder instability, prosthetic loosening over time, rotator cuff tears, nerve injury, and deltoid muscle dysfunction.

Long Term Outcomes
TSA results in the alleviation of about 90% of shoulder pain. Norwegian researchers who studied 1,107 patients in the Norwegian Arthroplasty Register found that patients with osteoarthritis and rheumatoid arthritis experience more substantial improvements in function, pain, and quality of life after TSA than do patients who undergo TSA for treatment of fracture sequelae (Fevang et al., 2012). In a study of 63 TSAs performed in 58 patients, the 5-, 10-, 15-, and 20-year implant survival rates were 98%, 89%, 73%, and 70%, respectively (Raiss et al., 2014).

Assessment

› Laboratory Tests That May Be Ordered
  • C-reactive protein level and erythrocyte sedimentation rate (ESR) may be ordered to assess for infection; elevations indicate infection
  • UA may be ordered to assess for occult urinary tract infection
  • Coagulation studies may be ordered in patients with a history of bleeding, alcoholism, or liver disease

Cinahl Information Systems, a division of EBSCO Information Services. Copyright©2016, Cinahl Information Systems. All rights reserved. No part of this may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the publisher. Cinahl Information Systems accepts no liability for advice or information given herein or errors/omissions in the text. It is merely intended as a general informational overview of the subject for the healthcare professional. Cinahl Information Systems, 1509 Wilson Terrace, Glendale, CA 91206
Other Diagnostic Tests/Studies
• Anterior-posterior, axillary, and lateral X-rays may be ordered preoperatively to assess the extent of joint destruction and to measure for the prostheses; MRI or CT scan may also be ordered to more accurately evaluate the disease process
• Echocardiogram and cardiac stress tests may be performed preoperatively in older patients to assess cardiac function

Preoperative Treatment Goals

Promote Optimal Preoperative Status and Provide Supportive Care
• Follow facility pre- and postsurgical protocols to prepare the patient for TSA; reinforce pre- and postoperative education and verify completion of facility informed consent documents
• Assess patient’s anxiety level and coping ability; provide emotional support and information as appropriate to alleviate anxiety about surgery
• Assess for signs and symptoms of infection and ask about the incidence of infections (e.g., upper respiratory infection, urinary tract infection) within the 2 weeks prior to surgery
  – Administer prophylactic antibiotics, which are ordered preoperatively and continued for at least 24 hours
• Administer prescribed anticoagulants (e.g., warfarin, heparin) for VTE prophylaxis, as ordered
• Request consultation with PT to prepare the patient for postoperative rehabilitation

Postoperative Treatment Goals

Reduce Postoperative Pain and Discomfort
• Frequently assess pain level and manage initially with prescribed epidural analgesia, interscalene nerve block, or patient-controlled analgesia (PCA). After 24 hours, oral opioids with or without NSAIDs may be ordered
• Apply ice packs, as ordered
• Administer prescribed antiemetic agents for nausea and vomiting
• Elevate the head of the bed to 30°; use pillows to support the elbow of the operative arm

Reduce Risk for Infection, Venous Thromboembolism, and Other Complications
• Assess drain site and shoulder dressing. Monitor for signs of superficial infection, including performing frequent assessment for purulent discharge and redness and taking temperature regularly. Assist with/perform sterile dressing changes, as ordered
• Administer prophylactic antibiotics, as ordered, and educate on signs of deep infection, including increased shoulder pain and stiffness, fever, and inflammation
• Monitor for VTE; administer prescribed anticoagulants, apply/maintain compression stockings, and assist with prescribed exercise and early ambulation
• Assess circulation, motion, and sensation of the affected arm every 2–4 hours or per facility protocol

Promote Return to Prior Functional Level
• Use continuous passive motion machine, as ordered, to increase ROM
• Teach the patient how to properly wear the sling; explain that it should be worn at all times—except during dressing, showering, and ROM exercises—for at least 3 weeks after TSA unless the treating clinician indicates otherwise
• Teach the patient to dress and undress the affected arm first; if the patient requires assistive devices, verify that the patient understands proper use by asking him/her to provide a return demonstration after education on correct usage
• Assist the patient with PT exercises, as appropriate, and in performing prescribed ROM exercises

Promote Emotional Wellbeing and Educate
• Assess for anxiety, including that resulting from perceived changes in body image or function; provide emotional support, educate, and encourage discussion about gradual return to normal function and how postoperative treatment, including PT, assists recovery
• Request referral to a mental health clinician for counseling on coping strategies, if appropriate

Food for Thought
• Conventional TSA can only be performed in patients with a functional rotator cuff. Patients with large rotator cuff tears may benefit from reverse total shoulder arthroplasty (RTSA), in which the metal ball prosthesis is attached to the glenoid surface and the plastic cup is fixed to the upper end of the humerus
• Hemiarthroplasty, in which the surgeon replaces only the humeral head, is an alternative to TSA in some patients; however, authors of a recent meta-analysis of 4 clinical trials concluded that TSA is more effective than hemiarthroplasty in patients with shoulder osteoarthritis (Duan et al., 2013)
Red Flags
› Verify that the patient receives analgesia before postsurgical PT sessions
› If patient is on anticoagulants, monitor for signs of internal bleeding
› Monitor patient for correct positioning and appropriate use of the continuous passive motion machine
› If a postoperative infection is suspected, contact the treating clinician immediately

What Do I Need to Tell the Patient/Patient’s Family?
› Advise the patient to wear compression stockings for up to 2 weeks after surgery
› Explain/reinforce prescribed activity restrictions
› Teach the patient and/or a family member to change the dressing daily and to assess the incision for signs of infection; direct the patient/family member to seek immediate medical attention if infection is suspected
› Emphasize the importance of performing ROM exercises at home; advise the patient to premedicate with analgesics 30–60 minutes before initiating exercise

References