

Anesthetic management of bilateral partial shoulder replacement - An uncommon case

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ABSTRACT

Bilateral partial shoulder replacement (PSR) is a rare rather uncommon entity. It is used when glenoid socket is intact and does not need to be replaced. In these operations, humeral component is implanted and humeral head is replaced. Only ball of shoulder joint replaced. There is no need of plastic socket. The advantage is that it has smaller incision than total shoulder replacement. In this case, a 45-year-old female who fainted by poor nutrition and was lifted up with relatives by shoulder causing bilateral fracture of humeral head was selected. She needed bilateral urgent PSR. By and large, expertise is required in shoulder joint replacement. We planned anesthesia with interscalene brachial block with clonidine as additive on one side and general anesthesia for other side. Other side was supplemented with continuous catheter technique for post-operative pain relief and good physiotherapy.

Key words: Partial shoulder replacement, interscalene brachial plexus block, general anesthesia

INTRODUCTION

Shoulder joint is ball and socket type joint. Round head of the humerus bone fits into the glenoid of scapula. It allows moment of arm in all directions. Total shoulder replacement (TSR) and partial shoulder replacement (PSR)^[1] are not so popular as knee or hip replacement surgery.

Indications for TSR/PSR are to relieve arthritis pain or traumatic injury to shoulder [Figure 1] or to fix severe physical joint damage or as part of fracture treatment.^[2,3] Tennis and cricket players often land up with shoulder joint replacement with overzealous use of joint.

Regional anesthesia (RA) is perfectly suited for this, because it is very effective, safe (if the time-tested rules are obeyed) and can be administered preoperatively. RA can be used for intraoperative analgesia and continued through the post-operative period.


Glenoid cup and shoulder cup are made up of one piece (monobloc) shells are either (ultra-high-molecular-weight polyethylene) or metal. They are cemented in place in conventional Total shoulder replacement [Figure 2].

Reverse Total shoulder replacement [Figure 3] technique uses ball in the place of socket and socket in the place of ball.

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CASE REPORT

A 45-year-old averagely build female patient fainted in sitting position at home. Relatives tried to lift her, caught her shoulders, and presented with bilateral fracture of the neck of the humerus bone. She had

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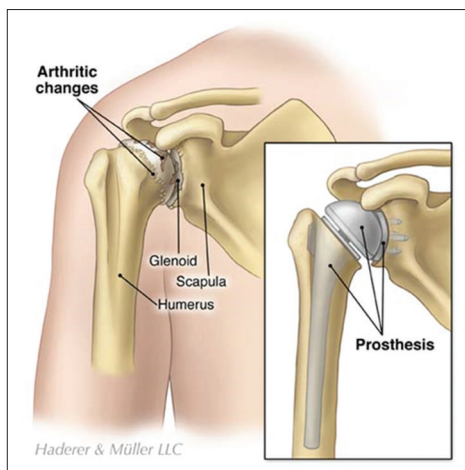


Figure 1: Diseased shoulder replacement



Figure 3: Reverse total shoulder replacement^[4-6]



Figure 2: Conventional total shoulder replacement

history of mild fever for 2 days and had less intake of food. Patient never had similar episode in the past. The X-ray report is shown in Figure 4.

Laboratory Reports

Hb: 10.9 g%
 TLC: 10,400/cmm
 ESR: Not raised
 Platelet: 2,56,000/cmm
 Serum electrolyte Na⁺: 136 mg%
 K⁺: 3.8 mg% Cl⁻: 105 mg%
 BSL: 90mg/dL Fasting and 110 mg/dL Post -Prandial
 BUL, S. Creatinine, Bilirubin: WNL Australia antigen: -ve
 HIV: -ve
 S. Protein showed hypoproteinemia
 Hypocalcaemia and Vitamin D3 deficiency

Bl. Group: O+ve

ECG: Sinus bradycardia with heart rate (HR) 60 beats per min.

2-D ECHO normal with LVEF = 55%

MRI: Normal study of brain.

This case could be conducted under interscalene brachial plexus nerve block (ISCBB) with O₂ facemask or general anesthesia (GA) as a sole technique.

As too many manipulations were needed, the plan was to give ISCBB + GA.

Advantage of ISCBB is immense post-operative pain relief which results in fewer complications after operation and patient's satisfaction.

Classical Technique of ISCBB

The patient is kept supine with the head rotated 45° away from the operative side. Lift the head of the patient and palpate contracting sternocleidomastoid muscle. Palpate clavicular head. The patient relaxes and move your fingers laterally and into the interscalene groove. It is a gap between the anterior and middle scalene muscle. At the apex of groove, mark a line parallel to cricothyroid cartilage. This is the point of entry for ISCBB. Figure 5 shows the landmarks.

Similar landmarks.

NYSORA* landmarks:

- Clavicular head of sternocleidomastoid
- Clavicle
- External jugular vein.

With peripheral nerve stimulator, 0.2-0.4 mA current is accepted as endpoint and pectoralis, deltoid, arm, forearm, and hand muscle twitches are seen.

10 mL of 2% injection lignocaine with adrenaline



Figure 4: X-Ray report of patient

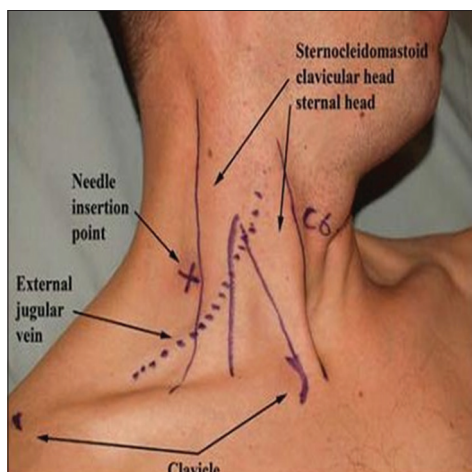


Figure 5: *New York School of Regional Anesthesia

and 10 mL of 0.5% injection bupivacaine local anesthetic mixture were prepared and were given on one side. Injection clonidine in the dose of 1 mcg/kg was added in ISCBB solution.

GA

The patient was induced with intravenous (IV) injection fentanyl, midazolam, and propofol following pre-oxygenation for 3–5 min by facemask.

Intubation was done with portex cuffed endotracheal tube (ETT) No. 7.5 after 75 mg IV injection succinylcholine.

Further paralysis with IV injection vecuronium (0.08 mg/kg) was achieved and was ventilated with N₂O (60%) + O₂ (40%) + sevoflurane (1.5%) for maintenance.

Dose of relaxant was repeated as 0.015 mg/kg after every 45 min IV.

This helped to maintain saturation and hypotensive anesthesia which minimized the blood loss.

Monitoring was done for HR, BP, SpO₂, ETCO₂, and ECG. Blood pressure was maintained to 90/60 mm of Hg with the mean blood pressure to 70 mm of Hg.

The patient was reversed with 0.4 mg of injection glycopyrolate and 2.5 mg of injection neostigmine IV.

Total duration surgery was 5 h.

Other side was supplemented with supraclavicular brachial block with continuous catheter technique. 20 mL of 0.125% injection bupivacaine was nearly given after 5 h duration for post-operative analgesia while addition of injection clonidine gave intense post-operative analgesia on the previous side.

Following surgery, the patient was well conscious and was shifted to intensive care unit for further monitoring. O₂ mask was supplemented to maintain saturation. Moreover, propped up position was given. Anti-coagulant and antibiotic prophylaxis were given, and the arms were immobilized. Physiotherapy was added for better post-operative outcome.

DISCUSSION

Bilateral shoulder replacement is a rare, rather uncommon entity. It can be replaced with a gap of 1 week of surgery. However, in this case due to severe displacement and a fear of avascular necrosis, surgery is commenced under one sitting. ISCBB gives:

- Better analgesia
- Greater patient satisfaction
- Fewer side effects.
 - a. Pain
 - b. Nausea
 - c. Sedation.
- Hemodynamics stability.

Bilateral ISCBB may cause bilateral hemidiaphragmatic paresis,^[7,8] and hence, we preferred general anesthesia on the other side for operation, and continuous catheter injection of local anesthetic was chosen as a method of choice for post-operative pain relief for early mobilization with good physiotherapy.^[1,2]

Surgery Went Uneventful

Further pain relief was achieved with IV injection diclofenac sodium and injection tramadol for nearly 3 days followed by oral analgesics and anti-inflammatory drugs.

CONCLUSION

This type of cases can be conducted under ISCBB with O₂ facemask or GA as a sole technique. In 2010, GA was safe but had an associated mortality rate of approximately 1:3, 00, 000. We can now focus on the appropriate management of pre-, intra-, and post-operative pain.

The advantage of ISCBB is immense post-operative pain relief which results in fewer complications after operation.

We have preferred ISCBB with the addition of injection clonidine as additive on one side and GA with continuous supraclavicular catheterization technique on other side for better post-operative outcome.

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