Indian Journal of Medical Case Reports ISSN: 2319–3832(Online)
An Online International Journal Available at http://www.cibtech.org/jcr.htm
2013 Vol.2 (4) October-December, pp.46-50/Sathis Kumar

Case Report

TOTAL ELBOW ARTHOPLASTY FOR THE SALVAGE OF NON-UNION OF DISTAL HUMERAL FRACTURE

***Sathis Kumar G.**
Department of Orthopaedics, ACG Medical College, Chennai, India
**Author for Correspondence*

ABSTRACT
A sloppy hinged total elbow Baksi Prosthesis was used in a fifty-five years old woman with a tenyears old fracture Non-Union of distal humerus with a painful, unstable left elbow. A stable elbow with good functional result was obtained at eighteen months follow-up (Mayo-clinic scoring index for the elbow-MCSIE-85).

Key Words*: Total Elbow Arthoplasty (TEA), Non-union, Triceps, Distal Humerus*

INTRODUCTION

Total elbow Arthoplasty (TEA) is being done with excellent results in the management of severe arthritis elbow since many decades. It has also been studied and used in selected cases in management of complex distalhumeral fractures in elderly with osteoporosis where ORIF was deemed unsuitable and in non-union of distal humerus with severe articular damage and/ or osteoporosis. Here we report a case of ten years old non-union of distal humeral fracture with severe articular damage managed by TEA.

CASES

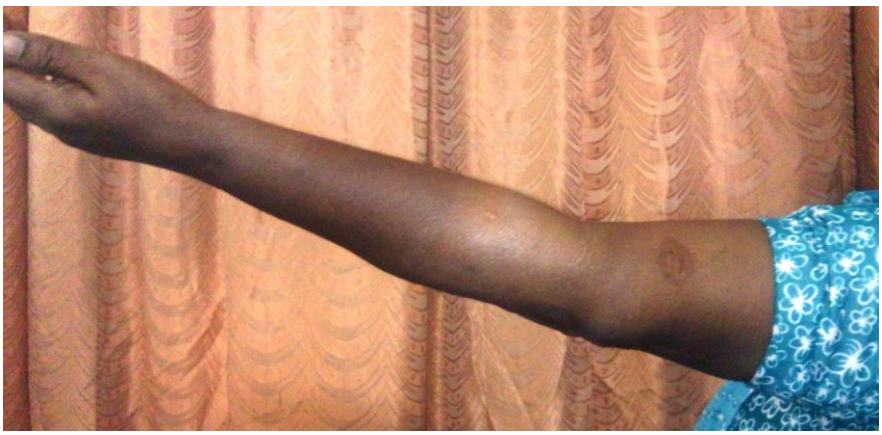
A fifty-five years old female, an office attendant by occupation, sustained a left elbow fracture ten years ago and was treated by a bone setter. She presented to us with a painful (VAS Score 7), partially flail elbow that was unable to support her activities of daily living (ADL). On examination, she had a gun-stock deformity, grossly unstable elbow without distal neuro-vascular deficit. She had good motor power in her biceps, triceps. Flexion-extension arc was 60°to 100°(large part of movem at the non-union). Pronation and supination could not be assessed due to rotational instability of distal fragment. Her pre-op MCSIE was 30 points. She had a clinically normal shoulder and cervical spine. She also had a malunited distal radial styloid fracture. After a CT-scan of elbow, an ORIF with Bone grafting was considered unsuitable/ impossible due to the complexity of the fracture, articular bone loss and osteoporosis (figure 1). Hence TEA was offered. Under general anaesthia, in right lateral position with arm over chest, after inflating the tourniquet, a posterior midline incision over the left elbow curving medially around the olecranon was made. Then through a paratricepital approach ulnar nerve was identified and safe-guarded. Loose bony fragments and the head of the radius were excised. Then lower end of humerus was cut transversely just proximal to olecranon fossa. A sub articular "L" shaped resection of upper end of ulna was done preserving the insertion of triceps and brachialis. Ulnar medullary canal was opened in the midportion of trochlear notch. Both medullary canals were reamed. Cement was injected into the humerus and ulna. Prosthesis was inserted, linked and secured firmly with the locking screw albeit with some difficulty. Stability and ROM were checked and found functionally adequate. Ulnar nerve was transposed anteriorly. The common flexor and extensor origins were attached to the triceps and wound closed, over a drain in layers. Surgical time was two hours. An Above Elbow Slab was applied. The drain was removed on the second post-operative day. The slab was maintained for twelve days till suture removal, to aid soft tissue healing. Thereafter graded mobilization of elbow was performed by the patient herself as dictated by pain. No formal physiotherapy was given. There were no issues with wound healing nor did we encounter any neurovascular complication.

When she started working again after one and a half months, she was reminded to avoid overuse (one kg of repeated lifting and upto four kgs occassionally was allowed). At eighteen months follow-up the elbow

is stable with a MCSIE of 85. Flexion-extension arc is 10˚-140˚, pronation 80˚, supination 90˚. She has minimal pain at medial aspect of elbow on exertion which does not require medication (VAS Score 2). X-ray shows good implant position without radiolucencies or signs of loosening [X-ray 3].

DISCUSSION

In non- union of distal humeral fractures TEA is commonly done to treat pain and instability in an elderly patient with osteoporosis and with a non-reconstructable (with ORIF) elbow (Akin, 2008). Contraindications include flaccid paralysis, non-restorable function of biceps and triceps, local infection, poor patient compliance and neuropathic joint (Stephen, 2006). Complications of TEA include triceps insufficiency, Infection, ulnar neuropathy, loosening, persistent pain, etc. We used the paratricepital approach wherein the triceps insertion was not disturbed, thus negating the 3% chance of triceps insufficiency (Joaquin, 2011). Since we safe-guarded the brachialis and triceps, we reattached the flexor and extensor origins to triceps. The hand grip and strength of all elbow movements are good (Joaquin, 2011) (clinical photos 1,2,3,4). Ulnar nerve was transposed anteriorly to avoid neuropathy that occurs in 5-7% of cases (Joaquin, 2011) due to irritation of the implant or from being caught in the fibrous tissue. Radial head replacement is not supported by Baksi prosthesis and so it was not considered.



Clinical Picture 1

Clinical Picture 2

Clinical Picture 3

Clinical Picture 4

X-ray 1: PREOP

Case Report

X-ray 2: Immediate POSTOP

X-ray 3: Follow-up at 18 months

In ORIF of distalhumerus, the major drawbacks are long term disability due to elbow stiffness, pain and the need for intense physiotherapy (Akin, 2008). In our case, Flexion-Extension arc has improved to 10˚ to 140˚ from pre-operative range of 60˚to 100˚. Joaquin (2011) showed that flexion-extension arc averaged 22^{o} to 135^{o} without the need for formal physiotherapy (Joaquin, 2011).

VAS pain score has improved to 2 points from 7 points pre-operatively. According to Joaquin (2011) in TEA 79% had little or no pain at a mean follow-up of 6.7 years. MCSIE has improved to 85 from 30 points pre-op. Implant survival with TEA for non union is 65% at 10 years (Akin, 2008) and in TEA for all indications put together is 92.5% at 10 years (Stephen, 2006; Micheal, 2010). But with overuse it is could be much less. Hence the weight restrictions were advised for our patient (Joaquin, 2011).

Most western authors are uneasy in recommending TEA for patients less than 60 years of age where life expectancy at birth is 75 years while it is 60-65 years in India (UN Fact Sheet) (Osteoporosis Fact Sheet).

Case Report

The peak incidence of osteoporosis in western world is at 70-80 years while in India it is 50-60years (International osteoporosis foundation) (UN WPP, 2010).

Considering the age and osteoporosis, we need more indigenous studies to formulate India specific recommendations.

Conclusion

In conclusion with the right patient selection TEA for non-union of distal humeral fractures is a worthwhile and rewarding salvage procedure.

REFERENCES

Akin Cil (2008). Linked Elbow Replacement: A salvage procedure for distal humerus non-union. *Journal of Bone and Joint Surgery- American Volume* **90** 1939-50.

Gambirasio R, Riand N, Stern R and Hoffmeyer P (2001). Total elbow replacement for complex fractures of the distal humerus. *Journal of Bone and Joint Surgery - British Volume* **83**B 974-78.

Joaquin Sanchez-Sotelo (2011). Total Elbow Arthoplasty. *The Open Orthopaedics Journal* **5** 115-123.

Micheal B Cross (2010). The evolution of elbow arthoplasty: Innovative solutions to complex clinical problems. *Journal of Bone and Joint Surgery- American Volume* **92**(supplement 2) 98-104.

Osteoporosis Fact Sheet (No Date). International Osteoporosis Foundation. Available: http://www.iofbonehealth.org/ 1-5.

Stephen D Trigg (2006). Total Elbow Arthoplasty: Current Concepts. *Northeast Florida Medicine* **57**(3) 37-40.

UN WPP (2010). World Population Prospects, the 2010 Revision: 2005-2010, Life expectancy. Available: http://esa.un.org/wpp/Documentation/pdf/WPP2010_Volume-I_Comprehensive-Tables.pdf 18-19.