

Functional Outcome of Darrach procedure in the Treatment of Ulnar Impaction Syndrome

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ABSTRACT

Objective: To determine the Functional Outcome of Darrach procedure in the treatment of ulnar impaction syndrome

Materials and Methods: This Retrospective Cohort study was carried out at Department of Orthopaedics and Traumatology, Khyber Teaching Hospital, Peshawar during the period from August 2007 to August 2013 including 30 patients who underwent Darrach's distal ulnar resection for ulnar impaction syndrome. We retrospectively reviewed the charts and radiographs of 30 patients who underwent Darrach procedure.

Results: Over a 6-year-period, 22 women and 8 men with a mean age of 35years (range, 20 to 50 years) had resection of the distal part of the ulna (Darrach procedure) to address ulnar impaction syndrome. Thirty wrists were operated upon. At an average follow-up of 2 years, 80% patients were satisfied and 63.3% had returned to their job. Majority (70%) of the wrists were pain free. Functional outcome was good in half of the wrists. There was a mean improvement of 23 and 11 degrees in supination and ulnar deviation respectively. Complications noticed were wrist instability in two patients and radioulnar convergence and carpal tunnel syndrome each in one patient.

Conclusion: Darrach procedure improves wrist's range of movements and pain in patients with ulnar impaction syndrome. Our results suggest that Darrach's resection osteotomy may be an effective way to unload the ulnocarpal joint without requiring internal fixation.

Key Words: distal ulnar resection; Darrach; ulnar impaction syndrome; ulnocarpal abutment.

INTRODUCTION

The ulnar impaction syndrome, also called ulnocarpal abutment syndrome, can be defined as the impaction of the ulnar head against the triangular fibrocartilage complex and ulnar carpus resulting in progressive degeneration of those structures.¹ Ulnar impaction syndrome is a common cause of ulnar-sided wrist pain.² The condition is usually idiopathic or posttraumatic, and patients present with painful wrist extension and ulnar deviation, particularly under load.^{2,3} There is often a positive ulnar variance resulting in increased contact pressures between the lunate and the ulnar head.^{1,2,4} Chronic impaction between these structures may lead to degeneration of the triangular fibrocartilage and chondromalacia of the lunate and the ulnar head.⁵

Nonoperative treatment alternatives include activity modification, anti-inflammatory medications, corticosteroid injections, and splinting.⁶ The surgical options include ulnar shortening osteotomy, the Feldon wafer resection, the Darrach procedure, the Pechlaner osteotomy, and the hemiresection arthroplasty described by Bowers.⁷ The wafer resection, Darrach procedure, and hemiresection arthroplasty all remove bone and cartilage from the distal ulna to remove the painful stimulus.^{7,8}

Excision of the distal ulna after fracture of the lower end of the radius was first described by Moore in 1880.⁹ Darrach (1912) advocated the procedure to increase the range of movement and decrease pain after trauma affecting the distal radio-ulnar joint.^{9,10} It gained widespread acceptance and has been used extensively with reports of satisfactory results in over 80% of patients and marked improvement in relief of pain and in the range of movement.^{11,12} Darrach procedure involves sub-periosteal exposure and resection of the ulnar head leaving behind the styloid process.^{12,13,14} Most studies have reported satisfactory results of the Darrach procedure, with

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marked improvement in pain relief and range of movement, and minimal loss of grip strength.^{15,16,17} Recent reviews of the Darrach operation, using more stringent assessments, have shown that only 50% of patients had a good result suggested that the procedure should be limited to patients with arthritis of the distal radio-ulnar joint.^{18,19} Due to this the Darrach procedure has fallen out of favour.^{18,19,20}

Since Darrach resection of the distal ulna is a simple and easy procedure, we aimed to determine its functional outcome in ulnar impaction syndrome.

PATIENTS AND METHODS

We retrospectively reviewed the charts of those patients who had undergone Darrach procedure during the period from Aug. 2007 to Aug. 2012. A total of 50 patients had undergone the procedure out of which 34 fulfilled our inclusion criteria. These were those patients, for whom the indication of surgery was pain due to ulnar impaction syndrome; who had undergone Darrach procedure of single wrist; in whom a straight lateral approach between the tendons of the flexor carpi ulnaris and extensor carpi ulnaris had been used for the procedure. Patients who had had the procedures performed for other indications, that had undergone darrach procedure on both wrists, and in whom other than the aforementioned lateral approach had been used were excluded from the study. These 34 patients were traced and asked to come for an interview. Two patients refused to take part in the study and two could not be traced. A detailed history was taken regarding their level of satisfaction after the operation and production of pain during activities of daily living. Clinical examination was carried out. Range of motion of various movements at the operated wrist was measured in degrees and compared to the preoperative measurements taken from the charts. Clinical outcome was graded using Modified Gartland and Werley criteria. Patients were also assessed for the presence of complications.

RESULTS

A total of thirty patients were included in the study. The mean age of the patients was 35 years (range, 20–50 years). Twenty two patients were male and 8 female. Thirty wrists were operated upon. Twenty three were dominant wrists and 7 were non-dominant.

In 24 of the 30 wrists the patients reported that they were satisfied with the results. Nineteen of the 25 patients had returned to their own job. Four of the 5 patients who were retired resumed their pre injury level of function or recreational activities.

Two years after the operation twenty wrists were rarely or never painful; six were painful with heavy or unusual activities and two with mild activities. One had pain at rest or at night (Table No. 1).

Table 1: Severity of pain in terms of activities of daily living

Pain on activities	Number of Patients
Never or rarely painful	21
Pain on heavy activities	06
Pain on mild activities	02
Pain at rest	01

Using the modified Gartland and Werley criteria for functional outcome, there were five excellent, 15 good, 7 fair and 3 poor results (Figure No. 1).

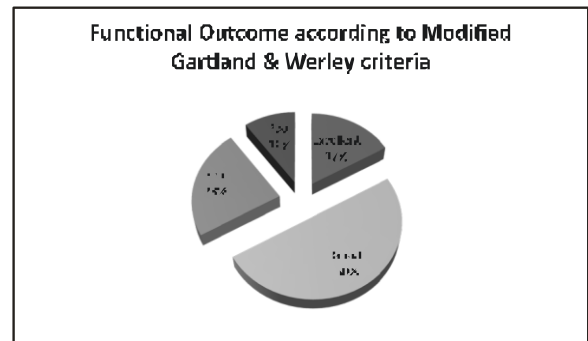


Figure 1: Clinical outcome of Darrach Procedure

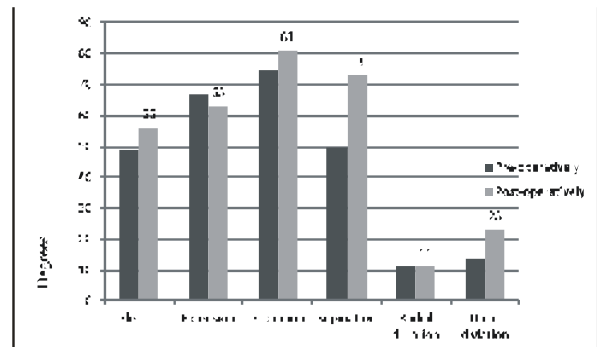


Figure 2: Mean movements (degrees) at the wrist before and after Darrach Procedure

Complications: Two patients had wrist instability; one had radioulnar convergence, and one carpal tunnel syndrome. No palmar subluxation was seen.

Table 2: Number of patients who developed long term complications (at 2 years)

Complications	Number of Patients
Wrist instability	2
Radioulnar convergence	1
Carpal tunnel syndrome	1
Palmar subluxation	0

DISCUSSION

Ulnar impaction syndrome is a common cause of ulnar-sided wrist pain. There are several well-accepted surgical techniques to treat this disorder by ulnar shortening. **Nonetheless**, all ulnar shortening osteotomies have complications specific to that procedure.

Several reports document the utility of the Darrach procedure, describing consistent improvement in range of motion, diminished pain in most patients, and no instances of increased disability^{1,5,8,17,22}.

A recent study by Grawe B et al reported the final average wrist range of motion after Darrach procedure to be 85°/78° and 41°/45° for pronation-supination and flexion-extension, respectively.²¹ Our results are pretty close to theirs.

Using the modified Gartland and Werley score preoperatively twenty-four out of thirty-one wrists were rated poor and seven fair in a study by Goo Hyun Baek et al.²² Postoperatively, the score improved so that twenty-four wrists were rated excellent; five, good; one, fair; and one, poor. Our study is consistent with this research.

Long term functional outcome in our study also goes well with the study of Loh et al in which twenty-three wrists in 22 patients (mean age, 37 years) with ulnar impaction syndrome were treated by ulnar shortening.⁴ At a mean follow-up time of 33 months, 17 patients had obtained good subjective pain relief and 16 were shown to have a good overall outcome.

Tatebe Masahiro in his study documented satisfactory results with ulnar shortening.¹² The average range of flexion-extension increased from 82% to 93%. Our results are close to this study.

Our study results agree with McKee and Richards who documented that Nineteen of the 23

patients were satisfied with the procedure¹⁹. Radioulnar impingement was uncommon and inconsistently symptomatic.

Our study had several limitations. Its small sample size, retrospective nature and the fact there was no control group prevents inference of concrete conclusions. The results would be enhanced with a prospective, comparison study with a larger patient population. The postoperative rehabilitation which does have an impact on the clinical outcome was not taken into account because of the non-availability of records. However we have described our preliminary results; an additional study is required to compare our technique with other standard techniques in a prospective fashion with validated scoring systems to evaluate outcomes.

CONCLUSION

Our results suggest that Darrach's resection of the distal ulna is a useful procedure for patients with impaction syndrome. In particular, the Darrach procedure achieved substantial gains in wrist's movements in our patients. Pain was uncommon and over all patient satisfaction and functional outcome was good.

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