Quality of Life After Plating of Midshaft Clavicle Fractures

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Background/Purpose: The clavicle is the most commonly fractured bone in the human body. Clavicular fractures occur mostly due to traffic accidents or sport injuries. Most often the fracture site lies in the middle third of the clavicle (81%). Surgical treatment often consists of open reduction and internal fixation (ORIF) using plates. A lot of research has been has been done into functional outcome after operative treatment. However, not much is known about the quality of life after operation in this, mostly young, population. Therefore we investigated the quality of life ≥1 year after plating for midshaft clavicular fractures.

Methods: Patients 16 to 65 years of age with a midshaft clavicular fracture who underwent surgical treatment in our hospital with ORIF between January 2006 and December 2014 were included in this study. Information about the course of treatment and postoperative complications was extracted from the hospitals records. Furthermore, all eligible patients were approached by phone and asked if they wanted to participate in the online survey. Primary outcome was quality of life ≥1 year after operation (measured using the Short Form 36 [SF-36], ranging from 0 [worst health possible] to 100 [best health possible] and the EuroQol [EQ]-5D-5L, ranging from 0 [death] to 1.0 [best possible health imaginable]). Secondary outcomes were postoperative complications, reoperation rate, patient satisfaction, and functional outcome (measured using the Disabilities of the Arm, Shoulder and Hand questionnaire [DASH], ranging from 0 [no disability] to 100 [severe disability]). Statistical analyses was performed using the Student *t* test and the X^2 test. Results with $P < 0.05$ were considered to be significant.

Results: We included 164 patients who underwent surgery for a midshaft clavicle fracture (mean age and SD 44.9 ± 15.1 years; table); 101 patients completed the online survey. The mean physical and mental SF-36 scored were 54.0 ± 7.3 and 52.3 ± 9.9, the EQ-5D-5L score was 0.87 ± 0.16, and the average DASH was 8.45 ± 13.8. In seven cases there was failure of the osteosynthesis material (OSM), five patients developed an infection, and two patients suffered from neuropraxia. Less common complications were thoracic outlet syndrome, refracture, and nonunion, all occurring in one patient. Overall, 77 patients underwent a reoperation. Isolated removal of the plate was the leading cause of reoperation (80.5%), followed by failure of the OSM (9.1%) and infection of the OSM (5.2%). Furthermore, we found a strong correlation between the functional outcome and the quality of life ($P < 0.001$).

Conclusion: Patients who received operative treatment for a midshaft clavicle fracture have a good quality of life, and a good functional outcome. Also, following plating for a midshaft clavicle fracture one in ten patients developed a complication. Almost half of the patients underwent a reoperation, with isolated implant removal as the most common procedure. Furthermore, there is a strong relationship between functional outcome and quality of life.

TABLE 1. Patient and Fracture Characteristic Research Cohort		
Characteristics	Total n=164	%
Sex		
Female	38	23,2
Male	126	76.8
Age *(mean ± SD)*	44.9 ± 15.1	NA*
Age cohort *(16 to 30:31 to 45:46 to 65)*	38/38/88	23.2/23.2/53.7
Fractured side		
Left	80	48.8
Right	83	50.6
Left & right	1	0.6
Fracture characteristics		
Displaced†	132	81.5
Comminuted‡	94	58.3
Shortened§	77	47.0
Delayed union¶	31	18.9
Non-union¶	5	3.0
Skin at risk	19	11.6

* NA indicates not applicable †In 2 cases there was no x-ray or description by the radiologist available (n=162). ‡ A comminuted fracture was defined as a fracture which consisted of ≥ 3 fracture parts (OTA classification B2.1-3.3). § A shortened fracture was defined as ≥ 20mm or more than one shaft width shortening. ¶ Delayed union and non-union/pseudoarthrosis were defined as a fracture which, prior to operation, had not adequately healed after 3 and 6 months respectively.

See pages 49 - 106 for financial disclosure information.