



Assessment of Quality of Life after Mandibular Fracture Treatment

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ABSTRACT

Mandibular fracture is the loss of mandibular bone continuity caused by trauma or pathological anomalies. This fracture may result in functional disability and pain in the mandibular bone, lowering overall quality of life.¹

Rashid's study conducted in London between June 2005 and May 2010 discovered that men (87%) had a higher frequency of mandibular fracture than women (13%). (male: female ratio 6.6: 1).The mandibular angle (30%) is the most common site of mandibular fracture, followed by parasymphysis (27%), and condyles (27%), interpersonal violence in male patients (77%) and women (46%), traffic collision

resulting in condylar fracture (53%), and 4% due to pathological causes.²

Mandibular fractures are classified into five groups based on the amount of fragments and the presence of bone destruction: incomplete fractures, single fractures, multiple fractures, comminuted fractures, and fractures with bone defects. A single fracture is a single mandibular fracture that has been separated into two fragments, whereas multiple fractures are mandibular fractures that have occurred in different locations and have been broken into several fragments.³

Mandibular fracture treatment aims to restore

mandibular morphology and function. Mandibular fracture therapy should begin as soon as possible, taking into account the patient's overall health and any harm to other parts of the body. The Open Reduction Internal Fixation Treatment (ORIF) for mandibular fracture is a surgical intervention that involves opening the mandibular fracture area and conducting a direct investigation through a surgical incision of the skin or mucosa to acquire a direct view of the fragmented bone fragment. Internal fixation of fracture fragments is performed utilizing intraosseous wiring, a small plate, and a screw in this procedure.⁴The benefits of this treatment include good treatment outcomes, a short treatment period, no IMF (Intermaxillary Fixation), and no interference with the patient's normal activities. ORIF procedure in post-fracture mandibular patients generally results in effective repositioning and fixation because it rapidly mobilizes the jaw.⁵

The patient's age, the kind of fracture, the number of fracture regions, the risk of infection, and the amount of time for adaptation after treatment are all factors that determine the success rate of mandibular fracture therapy.⁶ Evaluation treatment of mandibular fractures with ORIF and Closed reduction can be done by clinical examination of mandibular function with the Mandibular Mobility Index (MMI), consisting of occlusion, the maximal ability to open the mouth, maximal ability of the mandible to the left and right lateral, maximal mandibular protrusive, and the quality of life questionnaire, one of which is the general oral health Assessment Index (GOHAI) questionnaire.^{7,8}

Quality of life is defined as an individual's appraisal of one's position in life in the context of culture and

value systems, as indicated by one's life and its relationship with aims, expectations, standards set, and one's attention. Normalcy, including normal bodily processes and the ability to meet human needs, is also related to quality of life. The three major dimensions of quality of life are physiological or functional, psychological, and pain.⁹

The preliminary study's findings highlighted the necessity for further research into the description of quality of life following the treatment of mandibular fractures with closed reduction and ORIF utilizing a mini plate. This study was carried out to monitor the healing progress of patients following treatment for mandibular fractures in order to ensure that the healing process of patients was not exclusively focused on the physical state, but also on assessments of numerous factors, including physiological, psychological, and pain aspects.¹⁰Based on these descriptions, the authors hope to assess the quality of life in patients with mandibular fractures treated with closed and open reduction using GOHAI questionnaires and clinical tests at oral surgery department IDS Dental college, Bareilly.

MATERIAL AND METHODS

This study investigated case-control subjects after the treatment of mandibular fractures with closed and open reduction ORIF from January 2011 to December 2022 in the oral surgery department at IDS Dental college Bareilly.

Patients were chosen as research subjects based on inclusion criteria. Participants in the study were required to complete informed consent forms. The inclusion criteria were patients with mandibular fractures aged over 14 years, having single and multiple mandibular fractures, undergoing closed

reduction and ORIF treatment using mini plates, and having posttreatment for mandibular fractures at least for six months. Exclusion criteria were patients with skeletal disparities and malocclusions prior to fracture, patients with TMJ conditions prior to fracture, patients having maxillofacial trauma frequently after treatment of mandibular fractures, patients with psychiatric disorders, patients with pathological fractures, patients with insufficient medical record data, and patients who were difficult to contact and refusing to participate in research were excluded.

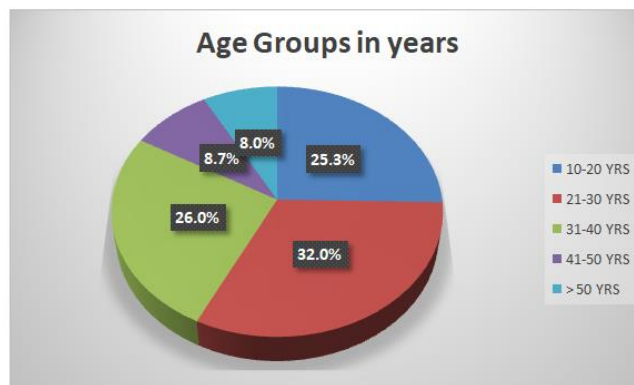
The MMI test and the GOHAI questionnaire were employed as research tools in this study. Patients were required to fill out an informed consent as one of the research requirements. After signing the informed consent form, the respondents were informed about the goal of the study and the research processes involving patient participation, followed by subjective examination and clinical examination of the research subject. Following anamnesis, a clinical examination based on the MMI scale was performed, which included occlusion, maximal open mouth, maximal of the mandible to the left and right lateral, and maximal mandibular protrusion. Then, the respondents were provided with GOHAI research questionnaire to reveal their current situation. To anticipate inquiries, the researcher joined the respondents while they filled

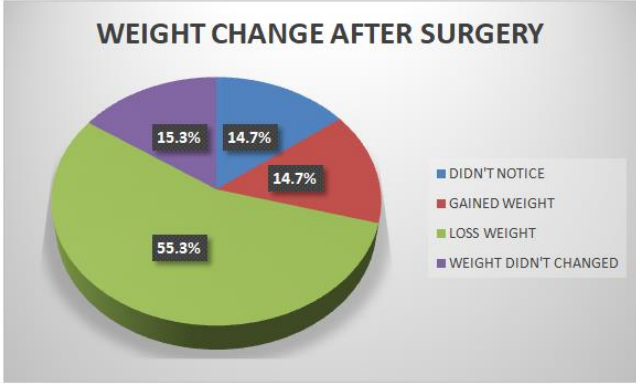
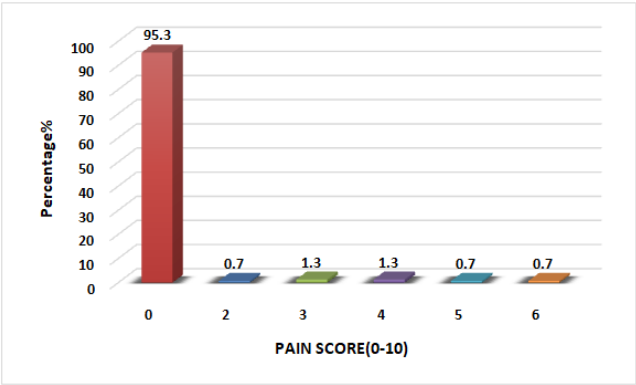
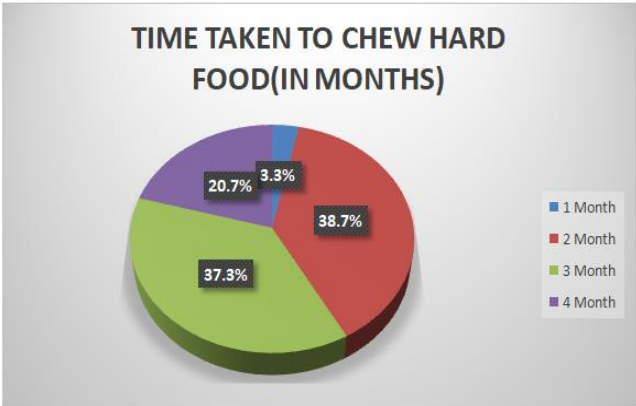
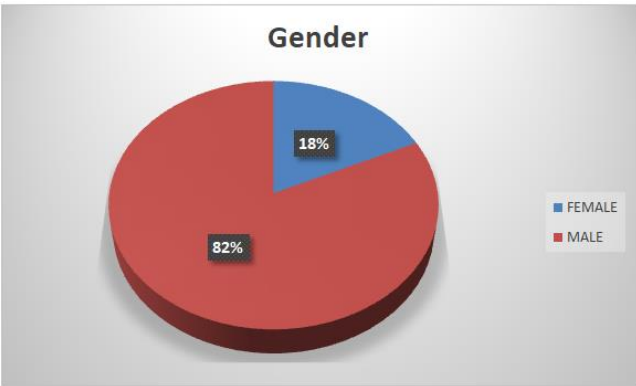
out the questionnaire. Following that, the researcher reviewed the questionnaires filled out by the respondents to ensure that all questions were answered completely, and the data was entered into the study form. The data obtained from the respondents were tested for normality with the Kolmogorov-Smirnov test. After completion, the test continued with a test of the difference in the quality of life between single and multiple with the Chi-Square test. The relationship between age and operating time with quality of life scores were assessed with Pearson's correlation

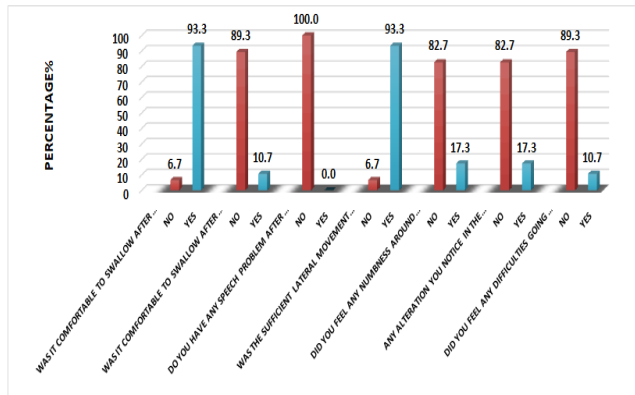
RESULTS

The research was conducted on 150 subjects undergoing treatment of mandibular fracture with closed reduction and ORIF revealed the characteristics of the research subjects (Table 1) with the maximum percentage of patients in age group of 21-30 year consisting of 123 male subjects and 27 female subjects.

The results of the study on evaluation measurements showed the time taken to chew hard food (in months) with the maximum 58 patients taking 2 months, pain score after fracture treatment was 0 in 143 patients, weight change after surgery with 83 patients (55.3%) suffering from weight loss, chewing capacity after the treatment was done was better in 143 patients (93%), and others questions.







DISCUSSION

A mandibular fracture can limit function and cause pain in the mandibular bone, lowering overall quality of life. The fundamental goal of mandibular fracture treatment is to restore mandibular structure and function.¹ORIF mandibular fracture is a surgical intervention that involves exposing the mandibular fracture area and conducting a direct exploration through a surgical incision of the skin or mucosa in order to obtain a direct view of the fractured bone fragment, whereas closed reduction involves jaw immobilisation via arch bar placement and intermaxillary fixation.⁴Normalcy, comprising the ability to perform regularly and meet everyday demands, is linked to quality of life. The three major dimensions of quality of life are physiological or functional, psychological, and pain-related.^{9,10}

Quality of life after treatment of mandibular fracture was conducted with ORIF using miniplate at oral surgery department IDS Bareilly on January 2011 - December 2022 by involving 150 people as the research subjects. The research subjects age range was of 10-70 years, with the maximum number of patients in age range between 21-30 years. The age group of 18-40 years is characterized as a productive age,

requiring high mobility and prominent activities, which are held responsible for traffic accidents.^{11,12}

These 150 people consisted of 123 males (82%) and 27 females (18%). The higher prevalence of mandibular fractures in males was related to the fact that more male subjects participated in more outdoor activities, such as driving vehicles or participating in sports, than females.¹²In the absence of infection, inflammation, fistula, malunion, malocclusion, discomfort, osteomyelitis, and osteoarthritis, treatment of mandibular fractures with closed reduction and ORIF was judged effective.^{13,14}GOHAI questionnaire questions revealed that the ability to chew, swallow, and experience discomfort had a significant impact on the individuals' quality of life.⁹

Large trauma produces serious harm involving numerous mandibular fractures and includes multiple fracture alignment places, resulting in a lengthier recovery phase.⁹The longer the postoperative duration of the research participants, the lower the MMI score, indicating a better clinical medical state of the research subject. Meanwhile, a lower GOHAI quality of life score suggests that patients' quality of life has improved. Yamamoto et al. (2004) discovered a

substantial difference in quality of life 6 months following treatment between condyle fracture alone and condyle fracture with additional mandibular fracture.¹⁷ Atchison (2006) found a link between GOHAI quality of life evaluation and clinical objectives such as the patient's capacity to open their mouth wide, mental health, and discomfort in patients with pan-facial fractures.¹⁰ The MMI clinical assessment revealed that the more aged the patient, greater the MMI score, indicating the worse clinical condition.⁷ Correlation between age and quality of life of patients based on GOHAI showed that the older the patient's age, the higher the quality of life score based on GOHAI, that the quality of life getting worse. Young research subjects have many active growth factors and thereby making faster recovery process than that of the old age. The decrease in growth factors, such as bone morphogenetic proteins (BMPs), transforming growth factor-beta (TGF-), insulin-like growth factors I and II (IGF-I and IGFII), platelet-derived growth factor (PDGF), and basic and acidic fibroblast growth factors (bFGF and aFGF), has been linked to the lower improvement in quality of life. Nikolaou et al., who evaluated subjects aged 65 and over with fracture healing, found that the elderly took longer to heal their fractures than patients aged 18-40 due to the existence of osteoporosis in radiographs.^{13,14}

CONCLUSION

In conclusion, the quality of life of single study individuals with mandibular fractures treated with closed reduction and ORIF is superior to that of subjects who had several mandibular fractures. The longer time of adaptation after management of mandibular fracture with closed reduction and ORIF,

the better the quality of life. Patients' quality of life at a young age is superior to that at an older age.

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