SDM
College of
Dental Sciences
& Hospital

# "COMPARISON OF BITE FORCES AFTER OPEN OR CLOSED TREATMENT OF MANDIBULAR CONDYLAR FRACTURES"



by

**Dr. DHANYA BALAKRISHNA**

Dissertation Submitted to the
**Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka**

In partial fulfillment
of the requirements for the degree of

**MASTER OF DENTAL SURGERY (M.D.S.)**

in

**ORAL AND MAXILLOFACIAL SURGERY**

**Under the guidance of**

**Dr.ABHIJIT JOSHI**

**Reader**

**DEPARTMENT OF ORAL AND MAXILLOFACIAL SURGERY**
**S.D.M. COLLEGE OF DENTAL SCIENCES & HOSPITAL**
**DHARWAD**

**2011-2014**

# ABSTRACT

**Purpose**: The aim of this study is tocompare the maximum voluntary bite forces in patients who received either closed or open treatment for mandibular condylar fractures and to study the associated masseter muscle activity.

**Patients and methods**: Thirty patients (28 males, 2 females), 15 treated by closed method and 15 treated by open method were included in this study. Maximum voluntary bite forces were measured at 3 weeks, 6 weeks, 12 weeks and 6 months postoperatively after the treatment of fracture. Tekscan Flexiforce B201H sensor along with the ELF$^{TM}$ software was used to record to bite force. Maximum isometric bite force measurements were recorded at 4 different tooth positions bilaterally. Electromyography (EMG) was used to assess masseter muscle activity. EMG was performed bilaterally after the bite force measurements using surface electrodes. Ratio of the working/ balancing side on the EMG was calculated. Data was analysed using non-parametric statistical methods.

**Results:** All patients treated by closed method had intracapsular fractures and patients treated by open method had extracapsular fractures. A highly significant statistical difference was observed in the maximum voluntary bite forces between the closed and open treatment groups at the initial 1$^{st}$ postoperative period. During the 2$^{nd}$ postoperative period, a gradual but significant increase in the molar bite forces was observed in the non-fractured side in both the groups. The 3$^{rd}$ postoperative period showed no significant difference in the 2 treatment groups. EMG recordings of the masseter activity showed significant difference at all 4 postoperative periods. Maximum bite force at all 4 tooth positions showed a significant difference during all postoperative periods in both treatment groups.

At the end of 6 months postoperative period, no significant difference was observed between the closed treatment group and the normal group; but asignificant difference was observed between the open treatment group and the normal. EMG values showed a significant difference in masseter muscle activity in both the treatment groups when compared to the normal group at the end of 6 months postoperatively.

**Conclusion:** Patients treated by closed treatment method showed an earlier rate of recovery of maximum voluntary bite forces when compared to the open treatment group. Both treatment groups showed changes in the masseter muscle activity to redistribute occlusal loads as a protective mechanism. Patients treated by closed and open method showed a significant difference in the working/ balancing ratio. Long term studies are needed to understand the complete rate of recovery in bite forces in patients treated with open reduction and fixation method (ORIF).

**Key words:** maximum voluntary bite forces, EMG, open method, closed method, masseter muscle activity, Tekscan Flexiforce sensor.