

WEIGHT LOSS DUE TO MAXILLOMANDIBULAR FIXATION IN MANDIBULAR FRACTURES

¹SAQIB GHAFOOR KAYANI, ²WASEEM AHMED, ³MOHAMMAD FAROOQ
⁴ATTA UR REHMAN, ⁵QASIM NAFEES, ⁶AMIR MUSHTAQ BAIG

ABSTRACT

The aim of this study was to calculate extent of weight loss (in kilograms) due to Maxillomandibular fixation in patients after trauma. Study design was prospective observational study. The study was conducted in Oral and Maxillofacial Surgery Department, Armed Forces Institute of Dentistry, Rawalpindi from February 2014 to July 2014 over a period of 06 months.

A total of 30 patients with only mandibular fracture were included in the study. Out of these 30 patients 27 patients were males and 03 patients were females. All patients were treated with Maxillomandibular fixation for 04 weeks. Weight of the patient was noted pre-operatively, 1st week post operatively and 4th week post operatively. Data was analyzed using SPSS version 20.

The study included 30 patients with mean age of 36.67 (SD +9.743) out which 90% were male and 10% were female. The overall weight loss sustained by patients in this study was 6 kilograms (kgs) at the end of first week post operatively and 5kilograms (kgs) at fourth week post operatively when compared with their weights before surgery. Within the limitations of this study, significant weight loss was observed at the first week post operatively among all patients.

Key Words: Maxillomandibular fixation, Weight loss, Mandibular fractures.

INTRODUCTION

Maxillomandibular fixation (MMF) is a basic and fundamental principle in the management and treatment of the maxillofacial trauma patient.¹ MMF serves as a cornerstone of maxillofacial reconstruction, providing a stable base from which facial form and function can be restored. It re-establishes the patient's pre-morbid occlusion assisting in the reduction and fixation of simple and complex facial fractures.² A variety of MMF techniques have been described.¹

MMF was first reported in seventeenth century and is most commonly used in the management of mandibular fractures.³ Its principle is simple, although somewhat flawed. The teeth are firmly attached to the bone fragments on either side of the fracture. By securing them into occlusion with the intact upper arch, the fracture will therefore be both reduced to the correct position and stabilized.^{1,3}

Advantages of MMF are that it is inexpensive, stainless steel wires are used, Leeway space is provided to the occlusion for adjustment, it is easy and not technique sensitive. Since it is conservative therefore surgical tissue damage is less. It is possible under local anesthesia.^{1,3}

Mandibular fractures are often associated with preexisting malocclusions, which may be difficult to define accurately. There may not be enough teeth to provide stability. Although the teeth may appear to be in the correct position (they can only be viewed from the buccal (labial aspects), muscle attachments may still displace bony fragments. When coexisting lower and upper face fractures are present, neither jaw is capable of correctly orientating and stabilizing the other.^{1,4} MMF is not without risk, especially in the early postoperative period. Patients may vomit and intra-oral bleeding may go undetected. As a result, patients who have had a general anesthetic frequently require the first postoperative night in an intensive-care or high-dependency bed.^{4,5} Patients may lose weight.^{2,5,6} Care is required in alcoholic and epileptic patients.^{1,3} Patients with respiratory disorders such as asthma have been shown to have deterioration in their respiratory function. Patients dislike MMF. Patients have difficulty in maintaining normal diet, oral hygiene.^{4,7} There are possible temporomandibular joint sequelae, muscular atrophy and stiffness, denervation of muscles due to alterations in fiber types, irreversible loss of bite force, weight loss and risk of inflicting injuries to operators manipulating wires.⁸⁻¹⁰

^{1,3,6} Saqib Ghafoor Kayani, Mohammad Farooq, Amir Mushtaq Baig. MCPS Resident, Oral Surgery, AFID, Rawalpindi, BDS
² Waseem Ahmed, Associate Professor, Oral and Maxillofacial Surgery, AFID, Rawalpindi, BDS, MGDS, FCPS
^{4,5} Atta Ur Rehman, Qasim Nafees, FCPS Resident, Oral Surgery, AFID, Rawalpindi, BDS

Corresponding Author: Dr Saqib Ghafoor Kayani
E-Mail: saqib206@gmail.com Cell: 0321-5562777
Address: House # 214/7, Ordnance Officers Mess Road, Rose Lane, Lal Kurti, Rawalpindi

Received for Publication: July 24, 2015
Revised: August 17, 2015
Approved: August 31, 2015

However, disadvantages of osteosynthesis seem to be of a technical rather than biological nature, which should be overcome. The fundamental problem of MMF is the unpleasant nature of the procedure and its poor results in certain fracture patterns, notably the mid-face.^{11,12} The aim of this study was to assess weight loss in patients due to MMF which was done for a period of four weeks after trauma (mandibular fractures). The rationale of this study is to observe weight loss in patients undergoing maxillomandibular fixation due to trauma.

METHODOLOGY

All adult patients having mandibular fractures undergoing MMF as part of their treatment irrespective of age and gender that reported to inpatient department of Armed Forces Institute of Dentistry were included in the study. Exclusion criteria included, pediatrics patients (below age of 12), geriatric patients (above age of 65), bi-maxillary or complex facial fractures, MMF for reasons other than trauma and patients having uncontrolled systemic metabolic diseases.

All patients were given MMF for four weeks, all with stainless steel wires. The patients were given same amount of nutrition in the form of liquid diet. Nutritional supplement (Ensure) was also included as a supportive nutritional aid for all the patients included in this study. All the patients were relieved from any sort of exertive physical activities.

The weight of the patients was recorded just before surgery, on first week post op and fourth week post op. These times were chosen as many patients experience eating problems during the first week after operation and all of these patients had their MMF removed at four weeks. The data comprised body weight of the selected patients. Weight was recorded using digital weighing machine (Sencor personal fitness scale SBS-111). Data was analyzed using SPSS version 20. The data was presented in frequencies and percentages.

RESULTS

30 patients were entered into the study. Out of these 30 patients, 27 (90%) patients were males and 03 (10%) were females. Age ranged from 22 to 60 years with mean of 36.67 SD of ±9.743. Among them 53.3% (n=16) belonged to age group of 22 to 35, 33.3% (n= 10) patients belonged to age group of 36 to 47 and 13.3% (n= 4) patients belonged to age group 48 to 60 years.

The pre op weight ranged from 52 to 96 kgs with mean weight of 80.57 kgs. Comparison of pre-op, first week post op and fourth week post op are shown in Table 1. The overall weight loss sustained by patients in this study was 6.0 kgs at first week post op and 5.0 kgs at fourth week post op when compared with their weights before surgery. Using Chi square test there was significant weight loss at first week post operatively in comparison to pre operative weight (Table 2). There was no significant (p = 0.082) difference in weight at fourth week post operatively in comparison to pre operative weight. Using one way ANOVA for correlation of gender with weight loss the statistics were not significant (Table 3).

TABLE 1: MEAN PRE-OP WEIGHT, 1ST WEEK POST OP AND 4TH WEEK POST OP IN KILOGRAMS

		Pre-op	1st week Post-op	4th week Post-op
N	Valid	30	30	30
	Missing	0	0	0
Mean		80.57	75.67	76.47
Std. Deviation		9.995	10.581	10.244
Minimum		52	45	50
Maximum		96	90	91

TABLE 2: CHI SQUARE TEST FOR WEIGHT LOSS FIRST WEEK POST OPERATIVELY

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	386.250	.042

TABLE 3: CORRELATION OF GENDER WITH WEIGHT LOSS USING ONE WAY ANOVA

Weight loss		F	Sig.
Pre-op	Between Groups	.385	.540
	Within Groups		
	Total		
1st week Postop	Between Groups	.468	.500
	Within Groups		
	Total		
4th week Post-op	Between Groups	.388	.538
	Within Groups		
	Total		

DISCUSSION

Patients present with multiple fractures in the orofacial region that require different mode of treatments ranging from close reduction to open reduction internal fixation or combination of both.^{1,3}

Many oral and maxillofacial operations compromise patients' ability to eat and drink in the early postoperative period and the period varies with the nature and extent of the procedure. Most of the patients undergoing simple dentoalveolar surgery find it uncomfortable to eat normally for the first 24 to 48 hrs but after that are soon able to resume a normal diet.^{2,4-6} Conversely, patients who have had orthognathic surgery or who have fractured their jaws are unable to take a normal diet for 6 to 8 weeks.^{10,13} If healing is to proceed normally, it is vital that all nutritional requirements are met throughout this period otherwise patients may become nutritionally deficient and dehydrated.⁴

Surgery and anesthesia disrupt the metabolic steady state initiating a catabolic process which is intensified by periods of limited nutritional intake. Muscle is catabolized for glucose production (gluconeogenesis) early in this phase, with additional protein breakdown from the metabolically active tissues that have been wounded surgically. The normal adult requires 1800 to 2000 calories per day.¹⁴

Patients who undergo surgical procedures after trauma are unable to take normal nutrition during healing phase for significant amount of time. Such patients are mostly bound to liquid diet only.⁴

In this study the overall weight loss sustained by patients in this study was 6 kgs at first week post op due to decrease in carbohydrate and protein intake. It was noted that all patients in this study had mandibular fractures and were treated with MMF alone. Patients had difficulty in maintaining nutrition during the first week post operatively but soon adjusted to liquid diet after one week.

In this study only weight of the patient was noted irrespective of their nutritional diet, socioeconomic status, healing and post operative complications. The overall weight loss in this study is 5 kgs which is in comparison with the study done by Worall SF et al in which total weight loss was 4.6 kgs.¹⁰ Further more patient started to gain weight by the 4th post operative week and there was no significant difference from the preoperative weight of patients.⁴ In other similar studies no significant weight loss was observed after 04 to 06 weeks of MMF. In another study in which MMF was used to control obesity also showed that prolonged use of MMF had no significant effect on the weight of the patient.^{6,15-17}

CONCLUSION

With in the limitations of this study, significant weight loss was observed at the first week post operatively among all patients.

REFERENCES

1 Ochs MW, Tucker MR. Management of facial fractures. In: Hupp JR, Ellis E, Tucker MR, editors. Contemporary Oral and Maxillofacial Surgery. 6th ed. St. Louis: Mosby, 2014; p. 491-518.
 2 Valiati R, Ibrahim D, Abreu Me, Heitz C, Oliveira Rb, Pagnon-

celli Rm, et al. The treatment of condylar fractures: to open or not to open? A critical review of this controversy. *Int J Med Sci* 2008; 5(6): 313-18.
 3 Perry M, Booth PW. Principles of fracture management: Timing, reduction and choice of fixation. In: Booth PW, Schendel S, Hausamen JE, editors. Maxillofacial Surgery. 2nd ed. London: Churchill Livingstone, 2007; p. 48-61.
 4 Adeyemi MF, Adeyemo WL, Ogunlewe MO, Ladeinde AL. Is healing outcome of 2 weeks intermaxillary fixation different from that of 4 to 6 weeks intermaxillary fixation in the treatment of mandibular fractures? *J Oral Maxillofac Surg.* 2012 Aug; 70(8): 1896-902.
 5 Jain S, Jain A, Palekar U, Shigli K, Pillai A, Pathak AD. Nutritional considerations for patients undergoing maxillofacial surgery – A literature review. *Ind J Dent.* 2014; 5: 52-55.
 6 Goss AN. Management of patients with jaws wired for obesity. A review of 122 cases. *Br Dent J* 1979; 146(11): 335-39.
 7 Behbehani F, Al-Aryan H, Al-Attar A, Al-Hamad N. Perceived effectiveness and side effects of intermaxillary fixation for diet control. *Int J Oral Maxillofac Surg.* 2006 Jul; 35(7): 618-23.
 8 Kanno T, Sukegawa S, Tatsumi H, Nariai Y, Ishibashi H, Furuki Y, Sekine J. The retromandibular transparotid approach for reduction and rigid internal fixation using two locking miniplates in mandibular condylar neck fractures. *Int J Oral Maxillofac Surg.* 2014 Feb; 43(2): 177-84.
 9 Thor A, Andersson L. Interdental wiring in jaw fractures: effects on teeth and surrounding tissues after a one year follow up. *Br J Oral Maxillofac Surg* 2001; 39(5): 398-401.
 10 Worall SF. Changes in weight and body composition after orthognathic surgery and jaw fractures: a comparison of miniplates and intermaxillary fixation. *Br J Oral Maxillofac Surg* 1994; 32(5): 289-92.
 11 Choi KY, Yang JD, Chung HY, Cho BC. Current concepts in the Mandibular Condyle Fracture Management Part I: Overview of Condylar Fracture. *Arch Plast Surg.* 2012 Jul; 39(4): 291-300.
 12 Champy M, Lodde JP, Schmitt R, Jaegar JH, Muster. Mandibular osteosynthesis by miniature screwed plates via a buccal approach. *J Maxillofac Surg* 1978; 6(1): 14-21.
 13 Shephard BC, Townsend GC, Goss AN. The oral effects of prolonged intermaxillary fixation by interdental eyelet wiring. *Int J Oral Surg* 1982; 11(5): 292-98.
 14 Hughes P, Bradrick JP, Yowler CJ. Nutrition for the oral and maxillofacial surgery patient. In: Fonseca RJ, Walker RV, Barber HD, Powers MP, Frost DE, editors. Oral and maxillofacial trauma. 4th ed. St. Louis: Mosby, 2013; 30-47.
 15 Blackburn GL. Effect of degree of weight loss on health benefits. *Obes Res* 1995; 3: 211-16.
 16 Garrow JS, Gardiner GT. Maintenance of weight loss in obese patients after jaw wiring. *Br Med J* 1981; 282(6267): 858-60.
 17 Cannell H. Enforced Intermaxillary Fixation (IMF) as a Treatment of Obesity. *Obes Surg.* 1992 Aug; 2(3): 225-30.

CONTRIBUTION BY AUTHORS

- 1 Saqib Ghafoor Kayani:** Main authro/operator.
- 2 Waseem Ahmed:** Supervisor.
- 3 Mohammad Farooq:** Co-author, patient selection & data collection
- 4 Atta Ur Rehman:** Patient follow up/analysis.
- 5 Qasim Nafees:** Pre & post operative managment.
- 6 Amir Mushtaq Baig:** Pre & post operative patient managment.