Case Report

BILATERAL FACIAL NERVE PARALYSIS: A CASE REPORT AND REVIEW OF LITERATURE

Basheer Rehman, Qiam ud Din

Khyber College of Dentistry, Peshawar - Pakistan

ABTRACT

Bilateral Facial Nerve Palsy is an exceedingly rare condition with aetiology often heralding the presence of a serious underlying medical illness. Mastication, speech and aesthetics are disturbed. The face is totally immobile and conveys no messages through facial expression. Frequently these patients are treated as if they are emotionally and mentally incompetent. Most patients require oral hygiene maintenance, mouth opening exercises and eliminating the source of possible odontogenic infection. There are many surgical procedures which can be of benefit depending on the patient's particular problem with the goal to support the mouth at rest and provide animation of the mouth and cheek.

Keywords: *Bilateral Facial Nerve Palsy, Bells Palsy, Trismus*

INTRODUCTION

Bilateral Facial Nerve Palsy (BFNP) is exceedingly rare condition with an incidence of 1 per 5,000,000 population[1]. BFNP was first described by Mobius in 1888 when he observed a patient with complete loss of facial expression[2]. Mc Laughlin[3], Davis[4], and Rubin[5] thereafter coined some important aspects of BFNP e.g. its aetiology and surgical treatment. However Manktelow[6,7,8] is considered to be the pioneer of modern reconstructive surgical procedures.

The aetiology of BFNP also differs from that of unilateral facial nerve palsy, often heralding the presence of a serious underlying medical illness[9]. There are many causes of BFNP and the most common are idiopathic (Bell's) palsy, Guillain-Barré Syndrome (GBS), Diabetes Mellitus, Bacterial Meningitis, Infectious Mononucleosis, Sarcoidosis and Human Immunodeficiency Virus infection. Other causes such as Lyme disease, Syphilis and Leprosy are well documented in the literature[10]. In a review of reported cases over a period of 10 years, Teller and Murphy[11] showed that Lyme disease is responsible for 36% of the cases for BFNP followed by Guillain-Barre syndrome (5%), Trauma (4%), Sarcoidosis and AIDS (0.9% each).

The findings in patients with BFNP are mild to moderate degree of limited mouth opening, poor oral hygiene and difficulty in producing labial speech sound as a result of incompetent lip seal[12]. Due to the paralysis of the orbicularis oris, the lower lip will frequently pout outward, making it difficult to control food and fluids. There is facial asymmetry at rest and inability to close eyes or smile with an additional concern of drooling and difficulty in managing the food bolus[8]. In BFNP, the face is totally immobile and conveys no messages through facial expression. Frequently these patients are treated as if they are emotionally and mentally incompetent.

Most patients require oral hygiene maintenance, active and/or passive exercises for the muscle of mastication. Eliminating the source of possible odontogenic infection will prevent complication in future[12]. Drops containing hydroxypropyl cellulose, hydroxypropyl methylcellulose, or polyvinyl alcohol are effective lubricating agents for preventing dryness of the eyes and last much longer than normal tears[7]. A thicker ointment that contains petrolatum, mineral oil, or lanolin alcohol is used at night to prevent drying of the eyes. Neuromuscular retraining supervised by an experienced therapist may be beneficial. Biofeedback exercises frequently provide significant benefit[7].

Correspondence:
Dr. Basheer Rehman
Department of Oral Pathology,
Khyber College of Dentistry, Peshawar - Pakistan
Cell: +92-3339199288
Email: trygeminal76@yahoo.com

The large number of available operations for the forehead, eye, mouth, nose, and cheek suggest that there is not one operation that will be successful in all patients. There are many procedures, that can be of benefit depending on the patient's particular problem. A brow lift by direct excision of tissue through an incision just above the eyebrow is the most effective technique. A coronal or endoscopic lift is another option[7]. The simplest effective procedure is lid loading with a gold prosthesis. The goal is to provide improved but not complete closure[7]. An alternative to the weight is the use of a palpebral spring as described by Morel-Fatio[13] or transfer of a strip of temporalis muscle provides a dynamic closure of the eyelid using autogenous tissue. A 1.5- 2 cm wide strip of temporalis muscle based inferiorly is extended with two strips of fascia or tendon, passed through the upper and lower eyelids, and fastened to the medial canthal ligament[14].

If the concern is primarily for asymmetry at rest, then a static procedure with slings of fascia lata or plantaris tendon can be quite beneficial[8]. Prosthetic material such as Gore-Tex (polytetrafluoroethylene) can also be used successfully[8]. Dynamic reconstructions can be accomplished with regional muscle transfers using the masseter muscle or the temporalis muscle or with microneurovascular muscle transfers. The goal is to support the mouth at rest and provide animation of the mouth and cheek. The majority of dynamic reconstructions involve the microneurovascular transfer of gracilis, the pectoralis minor, rectus abdominis, latissimus dorsi, extensor carpal radialis brevis, serratus anterior, tensor fascia lata, and abductor hallucis[6]. We present a case report of Bilateral facial paralysis with associated dental and skeletal malocclusion, although the presenting complaint was limited mouth opening, it brings up an important point for discussion of the BFNP.

CASE REPORT

A 28 year-old male with no previous medical illness presented to the Department of Oral & Maxillofacial Surgery at Khyber College of Dentistry with difficulty in chewing, limited mouth opening and slurring of speech. He was unable to close his eyes and the tongue had altered taste sensation. He was otherwise ambulant with no peripheral limb weakness. Further history revealed an episode of transient febrile illness and chest infection when he was 10 years of age although there was no history of trauma. He was a non-smoker and denied any history of illicit drug use, chemical exposure or inhalation.

Examination revealed peripheral (lower motor neuron) paresis of bilateral facial nerves (House-Brackmann grade V), bilateral Bell's phenomenon and inability to close his eyes completely, purse his lips or smile (Figure-1, 2 and 3). Examination of other cranial nerves was normal with no cerebellar signs. Sensory examination did not reveal any superficial or deep sensory loss or hyperaesthesia. Intra oral examination was difficult because of limited mouth opening and showed poor oral hygiene, grossly carious mandibular second molars on both sides, Angle class III malocclusion with narrow palatal arch and anterior open bite (Figure-4). A maximum mouth opening of 20 mm was recorded. Orthopantomogram (OPG) showed periapical radiolucencies beneath the grossly carious teeth and prominent gonial angles on both sides (Figure-5). His computed tomography of the brain revealed no obvious abnormality (Figure-6).

The patient's primary concern was limited mouth opening and difficulty in chewing; his both second mandibular molars were extracted and asked to report after a week. He reported back after 10 days and when examined the mouth opening was improved to 30 mm. The surgical modalities of treatment for facial paralysis, donor site morbidity and prognosis were discussed with the patient but he refused to undergo such extensive surgical interventions. Although he was willing to undergo orthodontic treatment for his malocclusion so he was referred to the Department of Orthodontics for further evaluation and management.

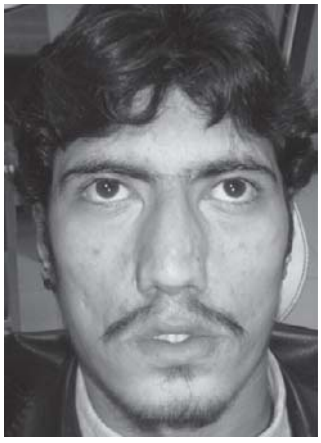

Fig. 1: Face at rest

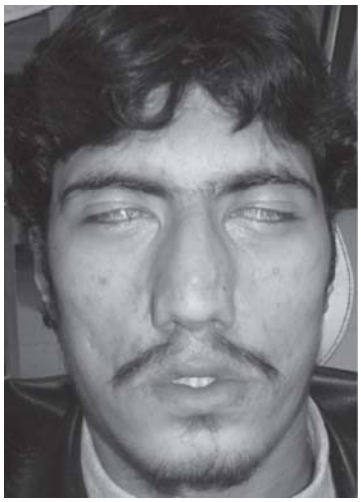

Fig. 2: Eye closure

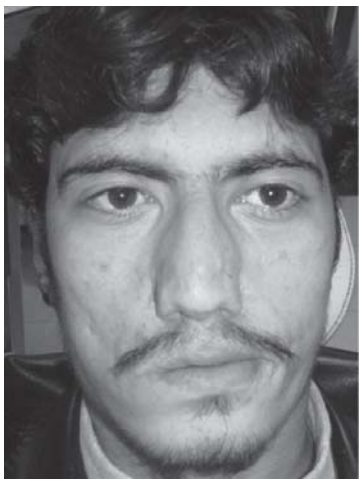

Fig. 3: Attempted smile

Fig. 4: Intra oral examination

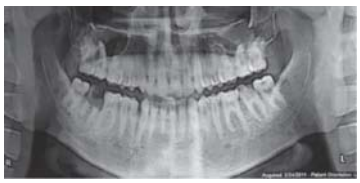

Fig. 5: Orthopantomogram (OPG)

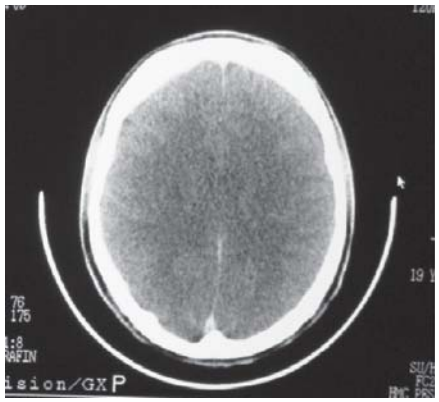

Fig. 6: Computed Tomography Scan

DISCUSSION

Limitation of mouth opening is most frequently caused by trismus, which is spasm of the muscles of mastication caused by odema or inflammation or odontogenic infection[15]. An improvement of mouth opening from 20 mm to 30 mm after dental extractions of grossly carious teeth suggests trismus associated with odontogenic infection. Limitation of mouth opening in this patient may also be due to changes in the load distribution acting upon the mandible as a result of altered neuromuscular recruitment pattern of the remaining functionally intact masticatory muscles. Adaptive mandibular positioning in response to an altered occlusal relationship may also lead to changes in jaw mobility[16]. The influence of the midfacial musculature upon growth and development of the maxilla and mandible is an established fact[16]. Facial paralysis results in an altered premaxillary, maxillary and mandibular growth with a simultaneous increase in mandibular ramal height accompanied by condylar growth alterations[16] such as prominent gonial angles in this case.

Male patients are least concerned with aesthetics and are more concern with functions[17]. Fear of extensive surgery as well as worldwide patient dissatisfaction from aesthetic surgical procedure make them reluctant. In our study, the patient was educated enough to respond well to counselling, but education may be considered as negative contributory factor in decision making for such procedures. Most of the educated population have electronic and print media facilities available such as internet, and they can go through published as well as unpublished literature[18]. The same was the case with our patient, who stated that "For the last so many years he is searching for solutions to his problems but he is not convinced by any method".

Reconstructive surgery of the facial nerve is not a daily routine for most oral and maxillofacial surgeons. The published experience on strategies to ensure optimal functional results for the patients are based on small case series with a large variety of surgical techniques[17]. If the paralysis is recent and reinnervation of the non-functional muscles is possible, then certain operations are available. If the paralysis is longstanding, then aetiology is largely irrelevant to the reconstruction[19].

On this background it is worthwhile to develop a standardized approach for diagnosis and treatment of patients asking for facial rehabilitation. A step-by-step clinical examination, MRI imaging and electromyographic examinations allow a classification of the palsy's aetiology as well as the determination of the severity of the palsy and the functional deficits. Considering the patient's desire and age, an individual surgical concept is applicable using McLaughlin's bilateral temporal transposition and bilateral microvascular gracilis flaps reinnervated by masseteric motor nerves[3,20]. The bilateral temporal transposition of Rubin may also be considered for these patients [21].

Acknowledgment

The Author is thankful to Miss Nigam Sattar, Final year BDS student and Mr. Ishfaq Mehmood, Computer operator of JKCD for their help during the preparation of this case report.

REFERENCES

1. Kim IS, Shin SH, Kim J, Lee WS, Lee HK. Correlation between MRI and operative findings in Bell's palsy and Ramsay Hunt syndrome. Yonsei Med J 2007; 48: 963-8.
2. Harrison DH. Surgical correction of facial palsy. Postgrad Med J 2005; 81: 562-7.
3. McLaughlin CR. Surgical support in permanent facial paralysis. Plast Reconstr Surg 1953; 11: 302-9.
4. Davis RA, Anson BJ, Budinger JM, Kurth LE. Surgical anatomy of the facial nerve and parotid gland based upon a study of 350 cervico-facial halves. Surg Gynaecol Obstet 1956; 102: 385-8.
5. Rubin LR. Temporalis muscle transposition technique for late permanent facial paralysis. In: Fredericks S, Brody GS. Symposium on the neurologic aspects of plastic surgery. St Louis: Mosby 1978; 133-41.
6. Manktelow RT, Zuker RM. Muscle transplantation by fascicular territory. Plast Reconstr Surg. 1984; 73: 32-6.
7. Manktelow RT. Use of the gold weight for lagopthalmos. Oper Tech Plast Reconstr Surg 1999; 6: 157-63.
8. Hussain G, Manktelow RT, Tomat LR. Depressor labii inferioris resection: an effective treatment for facial asymmetry caused by facial paralysis. Br J Plast Surg 2004; 57: 502-7.
9. Price T, Fife DG. Bilateral simultaneous facial nerve palsy. J Laryn Oto 2002; 116: 46-8.
10. Keane JR. Bilateral seventh nerve palsy: Analysis of 43 cases and review of the literature. Neurology 1994; 44: 1198-202.
11. Teller D, Murphy T. Bilateral facial paralysis: a case presentation and literature review. J Otolaryngol 1992; 21: 44-6.
12. Ralph T, Manktelow, Ronald M, Zuker, Peter C, Neligan. Facial paralysis reconstruction: In Grab & Smith's Plastic Surgery. 6th ed. New York: Lippincott Williams & Wilkins 2007; 417-27.
13. Levine RE. The enhanced palpebral spring. Oper Tech Plast Reconstr Surg 1999; 6: 152-8.
14. Salimbeni G. Eyelid reanimation in facial paralysis by temporalis muscle transfer. Oper Tech Plast Reconstr Surg 1999; 6: 159-64.
15. Wanninayaka MT, Odell EW. Difficulty in opening the mouth. In Odell EW. Clinical problem solving in Dentistry. 3rd ed. London: Elsevier 2010; 281-7.
16. Sinsel NK, Guelinckx PJ. Effect of facial paralysis on periosteal growth at the muscle-bone interface of facial muscles and facial bones. Plast Reconstr Surg 2003; 111(4): 1432-43.
17. Volk GF, Pante M, Lichius OG. Modern concepts in facial nerve reconstruction. Head & Face Medicine 2010; 6: 25-36.
18. Schwartz KL, Roe T, Northrup J, Meza J, Seifeldin R, Neale AV. Use of the Internet for Health Information: A MetroNet Study. The Journal of the American Board of Family Medicine 2006; 19: 39-45.
19. Biglioli F, Frigerio A, Rabbiosi D, Brusati R. Single-stage facial reanimation in the surgical treatment of unilateral established facial paralysis. Plast Reconstr Surg 2009; 124: 124-33.
20. Buis LJ, Nicolai JP. Surgical treatment of bilateral facial paralysis: six case reports. Eur J Plast Surg 2003; 26: 62-5.
21. Guntinas-Lichius O, Streppel M, Stennert E. Postoperative functional evaluation of different reanimation techniques for facial nerve repair. Am J Surg 2006; 191: 61-7.