Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 04, pp.49570-49573, April, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

FACIAL NERVE PARALYSIS AFTER IMPACTED LOWER THIRD MOLAR SURGERY: A CASE REPORT

***,[1]Dr. Sandeep Kaur, [1]Dr. Meenu Sangral and [2]Dr. Kirandeep Kaur**

[1]Department of Oral Medicine & Radiology, Indira Gandhi Government Dental College & Hospital, Jammu (J&K), India

[2]Department of Periodontology, Institute of Dental Studies & technologies, Kadrabad, Modi Nagar, Uttar Pradesh – 201 201, India

ARTICLE INFO

Article History:
Received 18th January, 2017
Received in revised form
10th February, 2017
Accepted 22nd March, 2017
Published online 30th April, 2017

Key words:

Facial Paralysis, Mandibular nerve, Molar, Tooth extraction, Anesthesia, Nerve block.

ABSTRACT

Facial nerve paralysis (FNP), or Bell's palsy is a neuropathy of the peripheral seventh cranial nerve, usually resulting from traumatic, compressive, infective, inflammatory or metabolic abnormalities and it results in a characteristic facial distortion that is determined in part by the nerves branches involved. However, in many cases no etiology is identified and the eventual diagnosis is idiopathic. Facial nerve palsy is a rare complication of an inferior alveolar nerve block anaesthesia. It may be either immediate or delayed, depending on the time between administration of injection to onset of symptoms. A case of 40 year old man reported to the clinical OPD (Outdoor patient) who developed facial paralysis 10 days after extraction of mandibular third molar under local anaesthesia, and subsided in about 3 months with minimal residual deficits.

Citation: Dr. Sandeep Kaur, Dr. Meenu Sangral and Dr. Kirandeep Kaur, 2017. "Facial nerve paralysis after impacted lower third molar surgery: A case report", *International Journal of Current Research*, 9, (04), 49570-49573.

INTRODUCTION

Facial nerve palsy can be seen as a result of a specific disease process such as its association with cerebrovascular events, acoustic neuroma, viral infections, and trauma. When the lower motor neuron facial nerve paralysis has no specific causes identifiable, it is termed Bell's palsy. (Monnell and Zachariah,) There have also been cases of Bell's palsy with a temporal relation to some dental related procedures and local anaesthesia administered for dental treatment. Cases of facial nerve injury due to dental procedure (Gray, 1978; Ling, 1985; Burke and Adams, 1987; Shuaib and Lee, 1990; Bobbitt *et al*., 2000; Tazi *et al*., 2003) are reported only by few authors. Gray *et al*. (1978) published a case of dental origin related to prolonged attempt to remove mandibular third molar and subsequent infection.

Case report

A 40 year old male patient, came to the Department of Oral Medicine & Radiology, Indira Gandhi Govt. Dental Hospital, Jammu 10 days after a dental extraction. He had received an inferior alveolar nerve block (lignocaine with epinephrine injection) for the extraction of impacted mandibular third molar. At presentation, his complaint was facial asymmetry, right sided facial numbness and inability to smile and shut his right eyelid when blinking and minimal swelling on the buccal surface of right side. He also reported difficulty in chewing food on the right side. According to him, these symptoms first started some 4-5 days after the dental procedure.

Clinical examination

On extra oral examination the patient had minimal swelling of right side of face. Deficit of facial muscles, drooping of right corner of the mouth when smiling were seen (Fig.1). He could not move the right side of his face normally. He had widening of the palpebral fissure, difficulty to raise his right eyebrow, inability to close his right eye completely. Bell's sign (failure to close the eye on the affected side with exposure of the sclera) was positive (Fig.2). Deviation of mandible towards left side was present (Fig 3).

Intra-oral examination showed that his right third molar socket region was healing quite normally. No other associated symptoms like loss of hearing or hyperacusis, dysguesia, fever etc. were reported and there was no history of any previous dental procedure. A diagnosis of Bell's palsy (House-

Corresponding author:* **Dr. Sandeep Kaur,
Department of Oral Medicine & Radiology, Indira Gandhi Government Dental College & Hospital, Jammu (J&K), India.

Brackmann Grade IV) was made and he was treated with Prednisolone, Vitamin B Complex (one tab BD for a month).

Prednisolone was prescribed as follows:

- 20 mg, 3 times a day for the first week;
- 20 mg, 2 times a day for the second week;
- 20 mg, once a day for the third week; and
- 10 mg, once a day for the fourth week.

Four weeks after the treatment was started, the patient reported with some improved symptoms. There was partial improvement in raising the right eyebrow, eye closure. Patient was advised for further follow-up. After three months of follow up the patient recovered from the facial musculature paralysis with minimal residual deficits. Additionaly ,during the course of treatment, artificial tears during the day and a sleep mask during the night to avoid conjunctiva dryness were advised to keep the eye moist and prevent exposure keratitis. He was advised to start facial physiotherapy exercises combined with warm water compresses. Patient was verbally educated on facial expression exercises as a home exercise program, and reciprocated demonstration and verbal understanding. Patient was agreeable to conducting home exercise program 2-3 times/day during the course of his treatment. Home exercises included pursing lips, frowning, smiling, winking with right eye, and "snarling" with an angry face expression. The patient was given a follow up appointment with the Neurology Specialist Clinic.

DISCUSSION

The condition Bell's palsy was first described in 1821 by Sir Charles Bell. According to May and Huges 1987, Bell's Palsy is an abrupt onset of unilateral weakness or paralysis of the face due to acute peripheral facial nerve dysfunction, with no readily identifiable cause, and with some recovery of function within 6 months. (May and Huges, 1987) The condition is characterized by sudden onset of complete or partial facial paralysis that usually occurs overnight. The literature describes different etiologies, such as: local anesthesia, (Tazi *et al*., 2003; Pogrel *et al*., 1995) tooth extraction, (Burke and Adams, 1987; Shuaib and Lee, 1990; Tazi *et al*., 2003) infections, (Gray, 1978; Bobbitt *et al*., 2000) osteotomies, preprosthethic procedures, excision of tumors or cysts, surgery of TMJ (Weinberg and Kryshtalskyj, 1992; Hall *et al*., 1985) and surgical treatment of facial fractures and cleft lip/palate. (Akal *et al*., 2000) The incidence of postoperative paralysis of the facial or damage to lingual and/or inferior alveolar nerves is described by many authors. (Tazi *et al*., 2003; Pogrel *et al*., 1995; Weinberg and Kryshtalskyj, 1992; Hall *et al*., 1985) Facial nerve paralysis may be central or peripheral in origin, complete or incomplete. Common causes of peripheral facial palsy. Modified from May and Schaitkin 2000.

Herpes Simplex Virus is responsible for idiopathic facial palsy, first suggested by Mc Cormick in 1972. Virus mainly Herpes Zoster could lead to facial palsy; dental treatment could cause reactivation of the virus. Ramsay Hunt Syndrome is caused by reactivation of Varicella-Zoster Virus (a herpes family virus) in the facial nerve, leading to facial paralysis on the involved side. This is accompanied by formation of vesicles and pain in the ear (zoster oticus), which clinically distinguishes this condition from bells palsy. Recent work suggests, many Bell's Palsy cases may be due to herpetic viral infections, particularly herpes simplex type 1 (HSV 1) or varicella. Reoccurrence rate is 7%. (Jackson and Doersten, 1999; Cousin, 2000)

Birth-related	Forceps delivery, Dystrophia myotonica, Mobius syndrome
Trauma	Basal skull fracture, Facial injuries, Scuba diving (barotrauma)
Neurological	Guillian-Barre syndrome, Multiple sclerosis, Myasthenia gravis
Infection	External otitis, Otitis media, Mastoiditis, Lyme disease, *Herpes zoster cephalicus*, Encephalitis, Poliomyelitis, Mumps, Mononucleosis, Tuberculosis, Acquired immunodeficiency syndrome (AIDS)
Metabolic	Diabetes mellitus, Pregnancy, Hypertension
Neoplastic	Cholesteatoma, Seventh nerve tumour, Glomus jugulare tumour, Meningioma, Sarcoma, Schwannoma, Malignant parotid lesions, Paramalignant phenomenon
Iatrogenic	Parotid surgery, Temporal bone surgery, Embolisation
Idiopathic	Bell's palsy
Other	Melkersson-Rosenthal syndrome, Amyloidosis, Sarcoidosis

Facial Palsy may occur possibly due to 3 main reasons:

1. Direct trauma to nerve from a needle
2. Intraneural hematoma formation or compression
3. Local anesthetic toxicity. (Burke and Adams, 1987; Pogrel *et al*., 1995)

It has been suggested that injection during the dental treatment cause vasoconstriction in vessel supplying the facial nerve. Stimulus for this vasospasm could be the adrenaline used as vasoconstrictor in the local anesthetic or direct damage from the needle. Swelling, is chaemia and compression could follow. (Cousin, 2000) Direct trauma may result due to trauma to nerve while injecting the needle. Usually the symptoms resolves completely having no residual nerve damage. (Pogrel *et al*., 1995) The needle may cause damage to small blood vessels leading to haemorrhage within the nerve, resulting in compression and fibrosis. There is no exact reason that explains why facial weakness occurs. When the anaesthetic solution is infused, direct anaesthesia of facial nerve occurs. The local anaesthetic itself is neurotoxic, that may damage the nerve. Bupivacaine and lidocaine are less neurotoxic than procaine and tetracaine. If local anaesthesia is injected intrathecally, neurotoxicity occurs where it can cause cauda equine syndrome or intrafascicularly in high concentrations. (Pogrel *et al*., 1995) Unilateral facial weakness, patients inability to close the eye competely due to denervation of orbicularis oris muscle are the utmost alarming symptoms of Bell's Palsy. Less common symptoms include hypercusis, drooling of corner of mouth of affected side, altered taste, decreased lacrimation, numbness or pain around the ear of affected side, flattening of the nasolabial fold, palpebral fissure widens.

Grading

Different facial grading scales have been developed. For facial nerve disorders in the USA and Europe, House-Brackmann Scale is widely used grading system and has six grades, or scores, where I = normal function and VI = complete paralysis (Table 1). House-Brackmann has given different grading system in order to assess the degree of nerve damage which ranges from grade I to VI.

Table 1.

I Normal	Normal facial function in all areas.
II Mild dysfunction	Gross: slight weakness noticeable on close inspection; may have very slight synkinesis At rest: normal symmetry and tone. Motion forehead: Moderate to good function Motion eye: complete closure with minimum effort Motion mouth: slight asymmetry
III Moderate dysfunction	Gross: obvious but not disfiguring difference between two sides; noticeable but not severe synkinesis, contracture and/or hemifacial spasm. At rest: normal symmetry and tone. Motion forehead: slight to moderate movement Motion eye: complete closure with effort Motion mouth: slightly weak with maximum effort
IV Moderately severe Dysfunction	Gross: obvious weakness and/or disfiguring asymmetry. At rest: normal symmetry and tone. Motion forehead: none Motion eye: incomplete closure Motion mouth: asymmetric with maximum effort.
V Severe dysfunction	Gross: only barely perceptible motion. At rest: asymmetry Motion forehead: none Motion eye: incomplete closure Motion mouth: slight movement
VI Total paralysis	No movement

Fig.1. Deficit of the facial muscle of the affected side

Fig.2. Bell's sign (Failure to closed the eye on the affected side with exposure of the sclera)

Fig 3. Deviation of jaw to left side

In this system, grades I and II are considered good prognosis, grades III and IV represent moderate dysfunction, and grades V and VI describe poor results. (Tashika Kushraj *et al*., 2014) Since in this case, Bell's palsy was detected at its mid stage (According to House-Brackmann grading system, it is grade IV) so prognosis was moderate and the patient almost recovered within 3 months with minimal residual deficits. The main goal of treatment is to improve the function of the facial nerve and reduce neuronal damage. In most of the cases, no treatment is required as it can spontaneously recover by itself. In the cases which are diagnosed at late stage or which requires treatment can be achieved with pharmacological, non-pharmacological or surgical means. (Julian Holland *et al*., 2004) Most of the patients were treated with tapering dose of Prednisolone along with the antiviral drugs depending on the cause of onset of the bells palsy. According to the American Academy of Neurology (AAN) guidelines 2012, recommended dose of prednisone is 1 mg/kg or 60 mg/day for 6 days, followed by a taper, for a total of 10 days. But the steroids should be given cautionally in pregnancy, Diabetes mellitus, Renal or hepatic dysfunction and especially in the children's who are in the growth period. (Tashika Kushraj *et al*., 2014)

Bell's Palsy has a good prognosis due to the reason that nerves have the tendency to regenerate at approximately 1 inch per month and they continue for a minimum of 18 months. (Smith, 1994) About 80% of cases showed complete recovery within 3 months of treatment. Prednisolone treatment in patients with Bell's Palsy greatly improves the chances of complete recovery. Widely used drugs to treat facial paralysis are corticosteroids and anti-viral drugs. Recovery of Bell's Palsy usually occurs within 4 weeks after occurance of symptoms followed by recovery within 6-12 months of paresis. (Lynch, 1994) oral steroids such as prednisolone given in doses of 40-60 mg/day and tapered dose over 7-10 days for complete resolution of symptoms. (Serafina Domanico: Bells Palsy: A Case Study, 1998) Resolution of symptoms of Bell's Palsy result from inflammation and edema of the nerve secondary to a viral causation. (Lynch, 1994) Complications includes incomplete recovery of facial nerve function, faulty reinnervation and reoccurrence is 7%. (Serafina Domanico: Bells Palsy: A Case Study, 1998) Facial spasm and contraction of facial muscles may occur. Surgery includes decompression of the facial nerve typically is considered only when facial paralysis is extensive and further treatment options have failed revealing complete paresis. (Jabor and Gianoli, 1996) Additionaly, physical therapy (Brach and VanSwearingen, 1999; Bell's Palsy Information Site) has a role in facial paralysis. Facial re-education exercises, surface EMG biofeedback, and direct current galvanic electrical stimulation are some of the treatment approaches. (Florence *et al*.,) In current practice Numthavaj *et al* recommended that treating Bell's Palsy with antivirals plus corticosteroids have slightly higher recovery rate compared to Prednisolone alone.

Conclusion

In general, the incidence of Bell's palsy associated with dental procedures is reported to be about 0.3%. During certain dental procedures, dentist should be aware not to damage the neural structures such as care should be taken while administering anaesthetic solution in inferior alveolar block anaesthesia .The accurate diagnosis of the cause of Bell's palsy and treating in its early stage helps in complete recovery of patient.Upon the appearance of facial palsy, the patient should be reassured and fully informed about any symptoms that occur. The patient should be referred to a neurologist for further evaluation and a clinical follow-up must be organized. The recovery is often total, but slow and progressive. In this case, temporary paralysis of the facial nerve may be caused by postoperative extraction of mandibular 3rd molar. The dentist may be the first to see such patients because of the orofacial involvement with paralysis of the facial nerve. Early treatment with Prednisolone significantly improves the recovery process.

REFERENCES

Akal UK, Sayan NB, Aydogan S, Yaman Z. 2000. Evaluation of the neurosensory deficiencies of oral and maxillofacial region following surgery. *Int J Oral Maxillofac Surg*., 29:331-6.

Bell's Palsy Information Site; Prednisone & Acyclovir Study; www.belspalsy.ws

Bobbitt TD, Subach PF, Giordano LS, Carmony BR. 2000. Partial facial nerve paralysis resulting from an infected mandibular third molar. *J Oral Maxillofac Surg*., 58:682-5.

Brach JS, VanSwearingen JM. 1999. Physical Therapy for Facial Paralysis: A Tailored Treatment Approach; Physical Therapy: April Vol. 79, Iss. 4; pg. 397

Burke RH. and Adams JL. 1987. Immediate cranial nerve paralysis during removal of a mandibular third molar. *Oral Surg Oral Med Oral Pathol*., 63:172-4.

Cousin CGS. 2000. Facial nerve palsy following intra-oral surgery performed with oral anaesthesia. *JR Coll Sug Edinb*., Oct; 45:330-333.

Florence P. Kendall PT, FAPTA, Elizabeth K. McCreary BA, Patricia G. Provance, PT. Muscles: Testing and Function. Fourth Edition. Lipincott Williams & Wilkins.

Gray RLM. 1978. Peripheral facial nerve paralysis of dental origin. *Br J Oral Surg*., 16:143-50.

Hall MB, Brown RW, Lebowitz MS. 1985. Facial nerve injury during surgery of the temporomandibular joint: a comparison of two dissection techniques. *J Oral Maxillofac Surg*., 43:20-3.

Jabor MA. and Gianoli G. 1996. Management of Bell's palsy. *In Journal Louisiana State Medical Society*, 148, 279-283.

Jackson CG. and Doersten PG. 1999. The facial nerve-current trends in diagnosis, treatment, and rehabilition. *Medical Clinics of North America*, 83:179-90.

Julian Holland, G.N. Raeme M. Weiner, 2004. Recent developments in Bell's palsy: *BMJ,* 329(4); 553-7.

Ling KC. 1985. Peripheral facial nerve paralysis after local dental anesthesia. *Oral Surg Oral Med Oral Pathol*., 60:23-4.

Lynch K. 1994. Facial nerve disorders. In E. Barker, editors. Neuroscience Nursing. St.Louis, Missouri: Year Book Inc. 455-458.

May M. and Huges GB. 1987. Facial nerve disorders: update 1987. *Am J Otol*., 8(2): 167-80

Monnell K, Zachariah SB, Bell Palsy. http://emedicine. medscape.com/article/1146903-overview.

Pogrel, MA, Bryan J. and Regezi JA. 1995. Nerve damage associated with inferior alveolar nerve blocks. *J Am Dent Assoc*., 126:1150-5.

Serafina Domanico: Bells Palsy: A Case Study. The Internet Journal of Advanced Nursing Practice. 1998. Volume 2 Number 1.

Shuaib A. and Lee MA. 1990. Recurrent peripheral facial nerve palsy after dental procedures. *Oral Surg Oral Med Oral Pathol*., 70:738-40.

Smith SA. 1994. Peripheral neuropathies in children. In KF Swaiman. Pediatric Neurology: Principles and Practice. 2nd ed. St. Louis Missouri: Mosby-Year book, Inc.; 1429-1452.

Tashika Kushraj, Laxmikanth Chatra1, Prashanth Shenai, K. M. Veena, Prasanna Kumar Rao, Rachana V Prabhu, Prathima Shetty, K.A. Shahin, 2014. Bell's Palsy: A Case Report and Literature Review: *Cukurova Medical Journal,* 39(3):581-588

Tazi M, Soichot P, Perrin D. 2003. Facial palsy following dental extraction: report of 2 cases. *J Oral Maxillofac Surg*., 61:840-4.

Weinberg, S. and Kryshtalskyj, B. 1992. Facial nerve function following temporomandibular joint surgery using the preauricular approach. *J Oral Maxillofac Surg*., 50:1048-51.

****