

Poliomyelitis Affecting the Face

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ABSTRACT

Background: The global health and international development communities are nearer to their goal of a polio-free world despite substantial political and logistical hurdles. India became polio-free in Feb 25, 2012. Though the prevalence of communicable diseases is reducing, the residual disability as a consequence of it still marks the affected population, as in the case of bulbar/ bulbospinal poliomyelitis cases showing paralysis of facial muscles and muscles of mastication, facial asymmetry, muscular atrophy, difficulty in swallowing or phonation. Not only is there a need to empathize, if not understand, the pain of being physically disabled, we should do all that is in our reach to prevent it and failing that; recognise it at the earliest. This case report highlights orofacial complications leading to facial asymmetry of both hard and soft tissues, in a case of bulbospinal poliomyelitis.

Keywords: Poliomyelitis, oral motor function, facial asymmetry, oral health.

INTRODUCTION

Excitement mounts as the global health and international development communities anticipate a polio-free world. Despite substantial political and logistical hurdles, only 223 cases of wild poliovirus in three countries were reported in 2012.[1] The monumental task of interrupting wild poliovirus (WPV) transmission has been achieved and sustained in India already for two years.[2]

The special need of the hour is to maintain vigilance and not to lower guard against any future resurgence of polio, indigenous or imported, wild or vaccine. The fact remains that we have eliminated wild poliovirus transmission altogether. Now it remains for us to eliminate all risks of polio due to vaccine viruses, including vaccine-derived viruses. India achieved WPV (Wild Polio Virus) elimination using OPV (Oral polio vaccine) on 13 January 2012, but will have to move to phase 2 during which OPV

will have to be withdrawn under immunity cover of IPV (Inactivated polio vaccine).

However, elimination of new polio cases should not also signal an end to worldwide engagement with polio. As many as 20 million continue to live with the disabling consequences of the disease. In developed countries where polio immunization became universal after dissemination of the polio vaccine in the 1950s, almost all individuals who have had polio are now above age 50. But in many developing countries where polio vaccination campaigns reached large segments of the population only after 1988, millions disabled by polio are still children or young adults. [1] The prevalence of communicable diseases although gradually declining, like polio from India, the residual disability of the same will continue for another few decades, [3] as in the case of

bulbar/bulbospinal poliomyelitis cases showing paralysis of facial muscles and muscles of

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mastication,[4] facial asymmetry,[5] muscular atrophy,[6]difficulty in swallowing or phonation.[5]

Hence, physicians must be fully aware of this and remain prepared to address issues related to post polio complications.[3] This case report highlights facial paralysis leading to facial asymmetry of both hard and soft tissues, in a case of bulbospinal poliomyelitis.

CASE PRESENTATION

A 35 year old male reported to OPD of Darshan Dental College and hospital, Udaipur with a chief complaint of difficulty in chewing since long time. His history revealed that he was apparently well before 10 years of age, when he contracted fever, following which he was taken to a local physician who diagnosed him to be suffering from poliomyelitis. Patient reported being in coma at the time for a period of one and a half months, following which he experienced generalized weakness including weakness in facial muscles, muscle stiffness, difficulty in breathing and speaking. He was under treatment for a period of 4 months at that time. Patient reports that he has marked muscular atrophy in the right lower limb and paralysis of muscles of the left half of face, since then. Patient also gave history of not being immunized to poliomyelitis virus as a child. General physical examination revealed that he was of sthenic built with steppage gait. Paralysis of right leg was noted along with less girth of his left arm, when compared to the right. (Fig.1b,1c).

On extra-oral examination, face showed gross asymmetry assessed using patient's frontal profile photograph. Photograph of the subject was taken by positioning mid-sagittal plane vertical and the Frankfurt plane horizontal. The patient was asked to look straight ahead, unstrained, and the ears uncovered.[6] Comparison between the right and left side of frontal profile was done (Diagrammatic representation) using coral draw 2010. An increase in size of lower one third of left side of face was noted i.e. left Bigonial width was larger than right by 5mm (Fig 1b). On examining the motor function of 7th Cranial Nerve, the patient had one eyeball more exposed than the other along with flattening of nasiolabial fold and drooping of the corner of mouth on the left side when compared to the other side, in normal rest position (Fig 1c). On

assessing the nerve in function, there was positive Bell's sign w.r.t left eye (Fig 1d), noticeable reduced wrinkles on left side of forehead and patient was unable to symmetrically blow out the cheeks (Fig 1e) due to improper seal of lip on the affected (left) side. Left corner of lip appreciably pulled towards the right side when asked to smile (Fig 1f). Bimaxillary protrusion was present.

Provisonal diagnosis of Facial paralysis on left side of face due to Bulbospinal poliomyelitis was arrived at. Difficulty in chewing was due to Chronic Generalised Periodontitis.

INVESTIGATIONS

Digital panoramic radiographs were made using X Mind Pano D extra-oral radiograph machine. Digora software was used for measurements.

Panoramic radiograph revealed pronounced ante-gonial notch with mandibular body elongation (12.19 mm) on the left side with cranial base asymmetry while, right Ramus Height was (2.08mm) more than left. Skeletal findings revealed mandibular elongation, reduced ramus height and pronounced mandibular notch on the left side with cranial base asymmetry.(Fig 2).

DIFFERENTIAL DIAGNOSIS

Bells Palsy w.r.t left side of face

TREATMENT

Appropriate dental treatment was rendered.

Paralysis of the facial mimetic muscles causes loss of voluntary facial movement, loss of involuntary facial expression, and dysfunction in facial tone. It is a devastating condition with profound functional, aesthetic, and psychological consequences.[7] Patients with permanent facial paralysis generally require rehabilitation. For eye closure, gold weights are a popular method of eye protection.[8]

Reanastomosis, decompression, and grafting work exceptionally well when they are properly performed. The degree of functional recovery depends upon the patient's age, degree of nerve injury, length of the damaged segment, and the technical ability of the surgeon. The goals are to

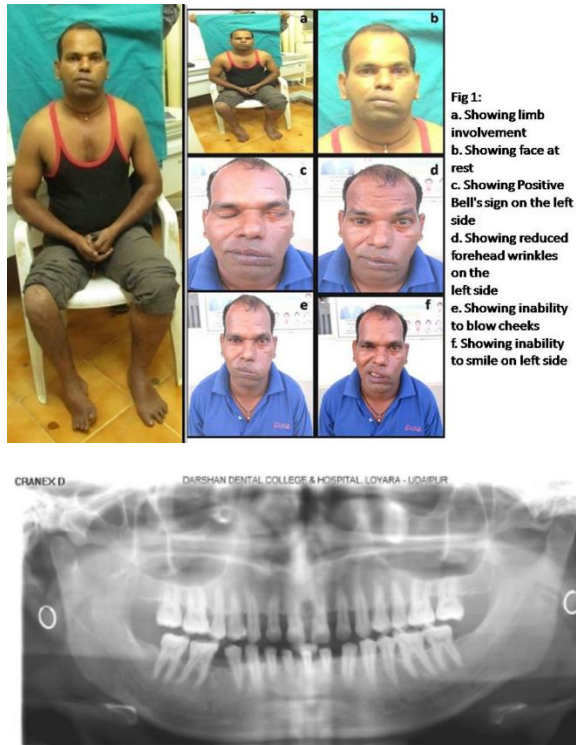


Fig 2: OPG revealed pronounced ante-gonial notch with mandibular body elongation on the left side with cranial base asymmetry while, right ramus height was more than left. Skeletal findings revealed mandibular elongation, reduced ramus height and pronounced mandibular notch on the left side with cranial base asymmetry.

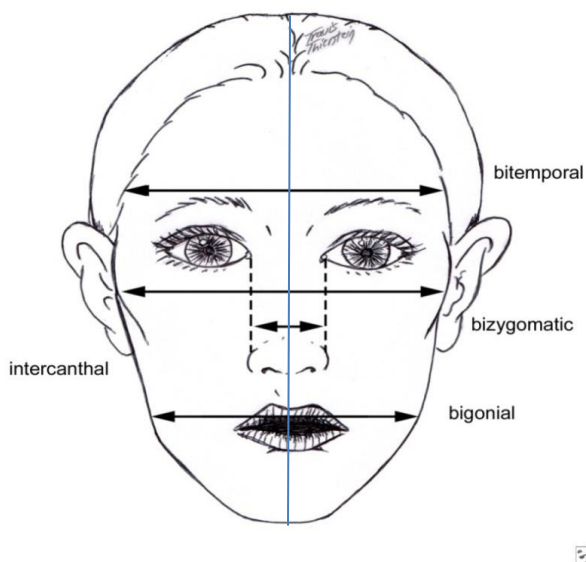


Fig 1: Diagrammatic representation of measuring Bigonial widths of face.

achieve protection of the eye, facial symmetry at rest, voluntary symmetric facial movement and to

restore involuntary mimetic facial expression. [7] In the present case, the patient was economically not sound and was not willing for surgical procedures.

DISCUSSION

Bulbar polio leads to weakness of muscles innervated by cranial nerves and accounted for 10 to 15% of paralytic cases. It can involve any of the cranial nerves and medullary reticular formation. Affected adults usually have bulbospinal poliomyelitis, whereas children are more likely to have isolated bulbar involvement. The most frequently involved cranial nerves are the 7th, 9th and 10th resulting in facial weakness and difficulty with swallowing and phonation. [4,9] Paralysis of muscles supplied by the 7th cranial nerve is of relatively frequent occurrence.[9] Trigeminal nerve palsies may be unilateral or bilateral in cases of bulbar paralytic poliomyelitis. [5,9]

In a review of cases of poliomyelitis treated in Northern Ireland Fever Hospital in 1952, Robinson stated that of the 45 paralytic cases, 12 had cranial nerve involvement, and of these the 7th nerve was affected in 7 cases, and 5th in 2 cases. The influence of the muscular system on the morphology of the bones has long been recognized. [Moss, 1962]. Vargervik and Miller [1984] support the idea that the epigenetic regulation of the bone is performed by muscles, according to the functional matrix theory. It is also reported that the asymmetry of neuromuscular functions and the masticatory apparatus can lead to an asymmetry of the mandible and the cranium and facial asymmetry inducing muscle dysfunction too [Captier et al., 2006].

Excessive antigonial notching has been previously associated with deficient mandibular growth, growth adaptation compensatory to aberrant muscular activity, and condylar pathology (Subtelny, 1985). M. Michael Cohen in his paper reports that mandibular asymmetry may be caused by infection (e.g. poliomyelitis) and trauma. The author observed because asymmetric forces act on the calvaria, craniofacial asymmetry often results. [10]

The neurological deficit of the facial nerve should be treated as soon as possible; facial muscles are embryologically not related to the

temporomandibular area and they are unaffected, so, if the paralysis is detected early, it is possible to perform a neuro-surgical intervention for restoring the neurological function in the region of the palsy and a symmetric perioral neuro-muscular function. Various treatment options [MacQuillan et al., 2003] are described in literature: a crossed facial nerve graft [Iñigo et al., 1993], transposing the anterior belly and the tendon of the digastric muscle to the region of the lower lip's orbicularis oris [Conley et al., 1982], using a neurovascular free muscle [Takushima et al., 2002]. Without this, a late mandibular repositioning obtained with surgical treatment cannot assure long term stability because the functional deficit of the neuro-muscular system will progressively condition the morphology of the skeletal structures: for this reason, it is very important to identify the pathogenetic mechanism of this condition for an accurate therapeutic program and to avoid the relapse of the pathology after an orthodontic or maxillofacial surgical treatment.

LEARNING POINTS/TAKE HOME MESSAGES

1. Early recognition and appropriate management of such cases.
2. Importance of phase 2 in Polio eradication (focussing on usage and availability of IPV).
3. Equipping oral physicians with knowledge and skills to recognise such cases.
4. Making dental treatment/clinic/environment more disability friendly.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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