Auris Nasus Larynx xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Auris Nasus Larynx

journal homepage: www.elsevier.com/locate/anl

Outcomes of pediatric delayed facial palsy after head trauma

Liping Li [a], Peng Xu [a], Aiyan Jin [a], Wenna Zuo [a], Xiaoming Su [a], Hongqin Wang [a], Yefeng Li [b], Xue Jiang [a,*]

[a] Department of Otolaryngology, Cangzhou Central Hospital, Cangzhou 061001, Hebei, PR China
[b] Department of Otolaryngology Head and Neck Surgery, Peking University Health Science Center, Beijing 100191, PR China

ARTICLE INFO

Article history:
Received 11 March 2017
Accepted 13 September 2017
Available online xxx

Keywords:
Head trauma
Delayed facial palsy
Pediatric
Clinical outcomes

ABSTRACT

Objective: To analyze clinical outcomes of delayed facial palsy after head trauma in the pediatric population.
Methods: A total of 45 pediatric cases with delayed facial palsy after head trauma were conservatively or surgically treated in our hospital between January 2009 and January 2015, and they were followed up for one year after the corresponding treatment. The clinical data were collected and the outcomes of facial nerve were analyzed.
Results: During the one-year follow-up, 33 cases (82.5%) completely recovered, and 5 cases (12.5%) recovered to Grade II among the 40 cases accepting conservative treatment. For the 5 surgically treated cases, 4 cases (80.0%) recovered to Grade I or Grade II, and one case recovered to Grade III.
Conclusion: The outcomes of pediatric delayed facial palsy after head trauma were generally satisfactory.

1. Introduction

Head trauma is common in children and the incidence of facial nerve injury after head trauma ranges from 7% to14.8% [1,2], with either immediate or delayed onset. Delayed facial palsy is defined as onset of facial palsy symptoms at least 48 h after the trauma [3]. There have been some reports about delayed facial palsy in adults after head trauma [3–5]. However, we did not find any reports focusing on pediatric delayed facial palsy after head trauma. Therefore, we retrospectively analyzed 45 children with delayed facial palsy after head trauma treated at our hospital from January 2009 to January 2015 and aimed to present the outcomes of facial nerve among the pediatric population.

2. Materials and methods

2.1. Materials

Forty five pediatric cases who developed delayed facial palsy among 2120 pediatric cases admitted due to head trauma from January 2009 to January 2015 at our hospital were reviewed retrospectively, and 225 pediatric cases with immediate facial palsy after head trauma were excluded in this study. Symptoms of facial nerve injury gradually appeared at least 48 h after trauma, including weakness of eyelid closure on the affected side, shallowing or disappearance of wrinkles on the forehead on the affected side, shallowing of the nasolabial groove, tilting of the mouth corner towards the affected side,

* Corresponding author.
E-mail address: jiangxue1718@126.com (X. Jiang).

http://dx.doi.org/10.1016/j.anl.2017.09.012
0385-8146/

and loss of taste sensation at the anterior 2/3 of the tongue on the affected side.

2.2. Auxiliary examinations

All cases received high-resolution CT (HRCT) of the temporal bone and brain CT. They also underwent facial electroneurography (ENoG) within 2 weeks of facial palsy onset, pure tone audiometry, Schirmer's test and taste test so as to determine the severity and position of facial nerve injury. Titers of virus were not examined in the present study, since the facial palsy in our study was thought to be related to trauma other than virus infection.

2.3. Treatment of delayed facial palsy

All cases took oral prednisolone tablets within 3 days after facial palsy onset at the dosage of 1 mg/(kg d) (the maximum dosage was 80 mg), once per day, for one week. The dosage was then decreased by 10 mg every two days. Total facial nerve decompression (middle cranial fossa combined with transmastoid approach) was given to the cases who showed more than 90% degeneration of nerve fibers revealed by ENoG.

2.4. Facial nerve function evaluation

House–Brackmann (HB) grading system was used for facial nerve function evaluation [6]. Before treatment, 4 cases were classified as Grade VI, 10 cases as Grade V, 26 cases as Grade IV, and 5 cases as Grade III.

3. Result

Of the 45 children with delayed facial palsy after head trauma, 31 cases were males and 14 cases were females, aged 4–14 years old (average, 6 ± 5.6 years). Facial palsy appeared on day 3–7 in 30 cases, day 8–14 in 10 cases, and day 15–21 in 5 cases (Fig. 1). And the mean period of delay was 7.2 ± 4.8 days (range, 3–21 days). 28 cases were caused by car accident and 17 by falling from the height. All of them reported an explicit history of head trauma and they were sent to hospital within 24 h after injury. 30 cases had different degrees of coma, and 13 cases lost consciousness. Ear and nose bleeding were noticed in 24 cases and 6 cases, respectively.

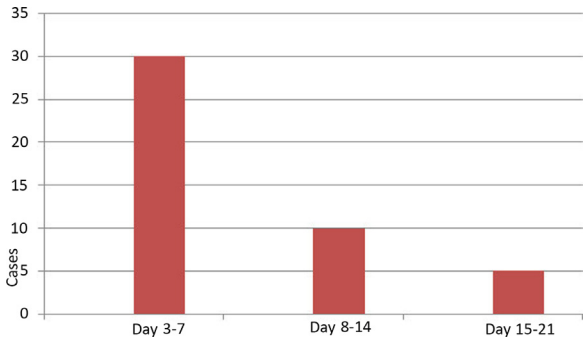

Fig. 1. Onset distribution of pediatric delayed facial palsy after head trauma. Facial palsy appeared on day 3–7 in 30 cases, day 8–14 in 10 cases, and day 15–21 in 5 cases.

Radiological examinations showed that there were 15 cases (33.3%) with temporal bone fractures, and 7 cases with cerebral contusion with dispersive hemorrhage. Fracture lines were not observed at the fallopian canal among the 30 cases with temporal bone fractures. According to ENoG of facial nerve, 40 cases had less than 90% degeneration of nerve fibers and 5 cases had greater than 90% degeneration. Pure tone audiometry showed that 25 cases had conductive hearing loss on the affected side, with hearing loss of 25–50 dB in speech frequencies (500 Hz, 1000 Hz and 2000 Hz), 4 cases had moderate to severe sensorineural hearing loss, and 24 cases had normal hearing. 21 cases had decreased secretion of tears on the affected side and 28 cases had taste loss on the affected side.

All the cases were followed up for one year. Among the 40 cases receiving conservative treatment, 29 of 40 cases (72.5%) completely recovered within one month, 2 cases (5%) recovered to Grade I between one month and two months, and 1 case recovered to Grade I between two months and three months. One year later, 38 of 40 cases (95%) recovered to Grade I or Grade II (good recovery). Specifically, 33 cases (82.5%) completely recovered, and 5 cases (12.5%) recovered to Grade II (Table 1). Only 5 of 45 cases who showed more than 90% degeneration of nerve fibers revealed by ENoG underwent total facial nerve decompression. Among the 5 cases receiving surgical decompression, edema of facial nerve was found in all the 5 cases, and micro-bony spicules were found in 1 case (20.0%). For the 5 surgically treated cases, one case recovered to Grade I (Fig. 2), three cases recovered to Grade II, and one case recovered to Grade III, with a good recovery rate of 80.0% (Table 2). No cases developed obvious complications due to surgical procedures. Only one of the five cases developed synkinesis, and none of the five cases showed contracture.

4. Discussion

Facial palsy following head trauma may be immediate or delayed. Sometimes, it is difficult to identify immediate or delayed facial palsy when the patient is in deep coma. Actually, we could not exclude the possibility that few immediate facial palsy cases might be contained in this study because of deep coma. The immediate onset of facial palsy after head trauma is mainly caused by temporal bone fractures which compress or transect facial nerve, while the reasons of delayed facial palsy are much more complicated. In our study, HRCT revealed temporal bone fractures in only 33% cases. Delayed facial palsy may be caused by fierce shock injury and subsequent edema of facial nerve or micro-bony spicules which are not revealed by high-resolution CT [5]. Sanus et al. [3] performed surgical exploration and decompression on 13 cases who had delayed facial palsy without gross temporal bone fractures on HRCT,

Table 1
Facial nerve function of 40 pediatric cases before and after conservative treatment (one year later).

HB grade	I	II	III	IV	V	VI
Before treatment	0	0	5	26	8	1
After treatment	33	5	1	0	0	0

Please cite this article in press as: Li L, et al. Outcomes of pediatric delayed facial palsy after head trauma. Auris Nasus Larynx (2017), http://dx.doi.org/10.1016/j.anl.2017.09.012