INJURIES INVOLVING THE TEETH AND JAWS IN YOUNG CHILDREN*

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The literature relating to fractures of the teeth and facial bones is surprisingly devoid of specific references to such injuries in the young child. With the object of endeavouring to make good this omission from the standard literature, it is intended to discuss some of the general aspects of maxillo-facial injuries in the child from birth to the age of 12 years.

What are the peculiarities of the young child which necessitate especial consideration in so far as treatment is concerned? These are essentially physical and mental. Physically the average child is not prone to serious facial injuries. This is readily borne out by the fact that less than 1% of all facial fractures occur in children of 6 years of age and under (MacLennan, 1956). Kazanjian and Converse (1949), state that 10% of all fractures of the mandible occur in children between the ages of 4 and 11 years, which further serves to indicate that the incidence of such lesions increases with age. Fractures involving the maxillary region account for less than 0.25% of those cases which have been dealt with by the author. To what can these low figures be attributed?

(a) The bony scaffold of the face in the young child is relatively elastic and in health, allied to the configuration of the anatomical structures concerned, does appear to possess a resistance to fractures which is not present in the adult to the same extent.

(b) Children are not exposed to as many of the hazards which predispose to fractures of the facial bones in adults.

Mentally, the average child who has been involved in an accident is not at all kindly disposed to co-operate in the course of his or her treatment. The belief that all children are fundamentally cooperative is an erroneous one. While it is undoubtedly true to state that time spent in gaining the confidence of a child will pay handsome dividends, it is only fair to observe that the very nature of the treatment re-

quired frequently places a premium on speed and efficiency if worthwhile results are to be obtained. Definitive treatment should therefore be undertaken so as to ensure that there are a minimum number of sessions between the child and the surgeon. The value of premedication and of anaesthesia should never be overlooked. Every effort should be made to provide fixation apparatus which is simple in construction, reliable, self-retaining and easy to keep clean. As in the treatment of all injuries involving the oral cavity a high degree of oral hygiene is essential throughout.

Before proceeding further it is intended to enumerate several details in respect of the deciduous and permanent dentitions which are related directly or indirectly to planning treatment in fractures of the facial bones in children.

(1) The complete deciduous dentition numbers 20, while that of the permanent dentition numbers 32.

(2) Every tooth consists of enamel, cementum, dentine and pulp, the latter of which is the vital structure most prone to irreparable damage following injury.

(3) A tooth with an open apex to the pulp canal has a better prognosis after trauma than that in which the apex has closed.

(4) The first permanent or 6-year-old molar tooth erupts immediately behind the second deciduous molar tooth.

(5) The shape of the crowns of the deciduous teeth is such that they tend to be widest at the cervical margin compared with teeth of the permanent dentition which constrict at the cervical margin: this precludes the use of the former for control with dental wiring or cast metal cap splint techniques, an observation which is also applicable to children with a mixed dentition of partially erupted permanent teeth and deciduous teeth with partially resorbed roots.

(6) In the deciduous and mixed dentitions the dental follicles of the still unerupted teeth, allied to the presence of secondary centres of ossification in bone,

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contraindicate the use of transosseous wiring as a method of fixation of fractures.

What are the most common causes of fractures of the teeth and facial bones in young children? They are: (a) A fall from a height; (b) a vehicular accident, child knocked over by a car, lorry, bus, etc., or fall from a bicycle; (c) accidental blow at sport, e.g., a blow from a hockey stick, a collision at soccer, a kick at rugby football.

Having alluded to the most common causes of fractures in children, it is proposed to enumerate the sites of these fractures in order of frequency omitting those of the nasal bones and skull, which it is not intended to deal with in this paper. They are: Fractures of teeth; subluxation of a tooth or teeth plus a fracture of the alveolus; dislocation of a tooth or teeth plus a fracture of the alveolus; fracture of the mandible condyloid process, of the body of the mandible, of the body of the mandible plus fracture of the condyloid processes; fracture of the zygomatic arch and/or zygomatic (malar) bone; fracture of maxillae.

Treatment of fractures of the facial bones can be considered under two headings, general and local. The general treatment in serious cases must be given precedence over the more specific local treatment. It should never be forgotten that the most perfect fixation and control of the local fractured fragments is of little avail if the child is lying in the mortuary. When the case is first seen the immediate attention should be directed towards the 'four controls', namely, control of respirations, control of haemorrhage, control of shock and control of the fractured fragments.

The routine use of antibiotics is to be deplored. There is, however, one definite indication for their use, namely, in those cases in which involvement of the meninges is suspected, when the patient should immediately be placed on penicillin and sulphadiazine or sulphamethazine to guard against the

possibility of meningitis. In other instances, antibiotics should usually be withheld unless there is, for example, a sudden rise in temperature or infection of the wound. In the latter a culture and/or antibiotic sensitivity test should be completed where possible.

The aim in treatment of all maxillo-facial injuries is to achieve reduction, immobilization and fixation of the fractured fragments in as near to the original anatomical position as possible. The following methods of local treatment are outlined, not because they are the only ones but rather because they serve to indicate some of the ways in which fractures of the facial bones can be dealt with, and in particular to draw attention to the fact that many teeth can be conserved if the correct treatment plan is followed with a minimum of delay. Many teeth have been needlessly sacrificed in the past either because of lack of facilities or lack of knowledge; neither is a valid excuse for producing abnormalities in a child which will persist, on occasion in an aggravated form, into adult life.

In fractures of teeth, the type of dentition influences the treatment, as also does the extent of tooth involvement. In the deciduous dentition the tooth or teeth concerned are usually extracted and a space retainer inserted where necessary. In the permanent dentition every effort should be made to retain the teeth (Fig. 1). There are essentially four types of fracture in the teeth of the permanent dentition: (1) Fracture of the crown of the tooth not involving the pulp canal; (2) fracture of the crown of the tooth involving the pulp canal, the apex of which is open; (3) fracture of the crown of the tooth involving the pulp canal, the apex of which is closed; (4) fracture of the root of the tooth.

Fractures of the crown may necessitate pulp capping, pulpotomy or even pulpectomy followed by insertion of a root filling before the aesthetic conservation of the fractured tooth. With fractures of

FIG. 1.—Stainless steel lined cap to protect tooth with fractured crown.

FIG. 2.—Modified arch bar to splint a tooth with a fractured root.

FIG. 3.—Acrylic overlay splint with circumferential wires to control a fracture of the mandible.

the root it is essential to splint the tooth or teeth concerned and endeavour to keep occlusal stresses and strains from them in order to avoid further trauma (Fig. 2). With fractures of the alveolus the bone should be manipulated as soon as possible, teeth which cannot be retained extracted, and the mucoperiosteum carefully sutured, while teeth requiring support should be splinted. In fractures of the mandible, if the condyloid process alone is fractured, a supporting bandage for 10 to 12 days will suffice. MacGregor and Fordyce (1957) state that such fractures do in fact unite without any specific methods of control and point out that subsequent maldevelopment is not a complication. When the body of the mandible is involved the fragments should be fixed for a period of three to four weeks (Fig. 3), and can very simply and efficiently be effected by means of an acrylic overlay splint lined with black guttapercha and wired around the mandible (circumferential wiring). The Gillies temporal operation is a simple method for dealing with fractures of the zygomatic arch and/or zygomatic bone. More extensive procedures should not be embarked upon unless there is a definite indication for so doing.

Lastly there is the treatment of the child with a fracture of the maxilla to consider. Fortunately, even the young child tolerates a plaster of paris

FIG. 4.—Type of acrylic splint with lateral tubes and plaster of paris headcap for control of fracture of the maxillae.

headcap extremely well, and this can be utilized in conjunction with a modified Kingsley-type splint with lateral tubes for stability (Fig. 4). After the splints have been removed it should be appreciated that any minor discrepancy in the occlusion of the teeth will readily correct itself spontaneously. On completion of treatment every child should be encouraged to acquire the habit, if this has not already been established, of attending the dental surgeon regularly. In this way any necessary conservative and orthodontic correction can be carried out.

Summary

Various aspects of fractures involving the teeth and facial bones of the young child have been discussed including causation, sites and the general principles of treatment employed. The importance of preservation of teeth and of realignment of the fractured fragments as soon as possible has been emphasized.

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