

Orofacial trauma in child abuse: types, prevalence, management, and the dental profession's involvement

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Abstract

This article: (1) reviews the available data describing and documenting the types and prevalence of orofacial injuries in physically abused children; (2) reviews surveys indicating the dental profession's awareness of, experience with, and reporting of child abuse; and (3) recommends treatment for those injuries.

Studies demonstrate that: (1) trauma to the head and associated areas occurs in approximately 50% of the cases of physical abuse to children; (2) soft tissue injuries — most frequently bruises — are the most common injury sustained to the head and face and are the single most common injury sustained in child abuse; and (3) injuries to the upper lip and maxillary labial frenum may be a characteristic lesion in the severely abused young child.

Surveys of the dental profession clearly demonstrate that dentists: (1) do see suspicious cases of child abuse; (2) often fail to report their suspicions as is legally required; (3) do not have adequate training or knowledge of child abuse and neglect; and (4) report more cases if made aware of child abuse and neglect and their responsibility to report.

The physical abuse of children is a problem not limited to the medical or social service professions. Our profession has become increasingly aware of its

role in the detection, reporting, and treatment of the abused child. Numerous editorials have appeared in the dental literature alerting us to our moral and legal responsibility as health professionals in the recognition of child abuse.¹⁻¹³ In addition, many articles have appeared reviewing child abuse in general and discussing the dentist's role.¹⁴⁻⁵⁰ Several of these articles have appeared in state dental journals listing their particular state laws, reporting agencies, and hotline numbers.

The purposes of this paper are to: (1) review the available data describing and documenting the types and prevalence of orofacial injuries in physically abused children; (2) review surveys indicating the dental profession's awareness of, experience with, and reporting of child abuse; and (3) recommend treatment for those injuries.

Types and Prevalence of Orofacial Injuries in Child Abuse

It is a common finding that when an individual is attacked for whatever reason, the head and/or facial areas often are involved. This is because these areas are exposed and accessible and because the head often is considered representative of the whole being or

“self.”^{27,51} It is therefore not surprising that physical abuse of children often involves the head and facial areas.

In 1946 Caffey⁵² described 6 infants suffering from chronic subdural hematomas who presented with multiple fractures in their long bones. It was in this classic article that the abused child and some of the common characteristics of abuse first were described. In 3 of the 6 cases, orofacial injuries were noted. One child presented with swollen and hemorrhagic gums, petechiae in the oral mucosa and ecchymosis of the face. The other 2 children both exhibited bruises of the face.

The term “battered child syndrome” was coined by Dr. Henry Kempe in his milestone article in 1962.⁵³ According to Kempe, this syndrome should be considered in any child exhibiting evidence of any bone fracture, subdural hematoma, failure to thrive, soft tissue swelling, or skin bruising.

The first study to examine the types of injuries sustained in the physically abused child was published in 1966 by Cameron et al.⁵⁴ This study examined the autopsy findings of 29 fatal cases of abuse seen over a 2-year period in the Department of Forensic Medicine at The London Hospital Medical College. Half of the children studied (mean age 14.3 months), had obvious bruises of the head, face, and neck and all exhibited soft tissue injuries. The prevalence and location of these injuries were as follows: 79%, scalp; 59%, neck; 52%, forehead; 49%, cheek; 48%, lower jaw and right leg; and 45%, upper lip region. Of the 13 areas described as sustaining soft tissue trauma, the head and neck areas were among the most frequently described. Lesions to the jaw and neck were well circumscribed and of a “finger-tip” character suggestive of gripping.

Lacerations of the mucosa of the inner aspect of the upper lip near the frenum and/or the occasional tearing of the lip from the alveolar margin of the gums occurred in 45% of Cameron’s cases. The age of the child is significant in this type of injury. A frenum tear is not uncommon in the young child who accidentally falls while learning to walk (generally between 6 months and 1 1/2 years). However, a frenum tear in a very young, nonambulatory patient (< 1 year), or an older, more stable child (> 2 years) should arouse one’s suspicion as to the possibility of this injury being nonaccidental. This type of injury may be the result of a blow to the mouth, an effort to silence a screaming child, or having forced a spoon or bottle into a baby’s mouth by an angry adult who is frustrated with a slow eater. It is based on *this* report alone that the torn frenum injury has been purported to be pathognomonic of child abuse in the dental literature. In no other study is such a high frequency reported.

Cameron et al. also state that bruises of the cheeks and sides of the head suggest blows or slaps with a fist or open hand. If the lesions are more localized and have underlying severe injuries, they may represent a severe blow or impact with a hard object.

The following year a British study by Skinner and Castle (1967) was published documenting the injuries to 78 abused children requiring medical attention.⁵⁵ Of these children, at least 34 (43.5%) sustained trauma to the face and mouth. This may in fact be an underestimate since some of the bruises were reported without location noted. The majority of the injuries were bruises, but also included lacerations, bites, and abrasions. Soft tissue injuries occurred in 77% of the cases, head injuries (skull fractures, subdural hematomas) in 28%, and bony injuries (fractures and dislocations) in 46%. Burns were the single most common injury in this study, occurring in 56 (72%) of the cases.

O’Neill et al. (1973) studied 110 cases of child abuse brought to the hospital over a 5-year period.⁵¹ Their study population included a large number of infants and children with head injuries. Thirty-two (29%) of the children had some form of intracranial injury, 15 (14%) had skull fractures and 23 (21%) were comatose. Almost all of the children had some degree of soft tissue injury and 55 (50%) were admitted primarily because of the soft tissue trauma.

Baetz et al. (1977) examined the records of 58 cases of battered children with 87 injuries occurring over a 4-year period.⁵⁶ Twenty-five (43%) of these children had head injuries of the following types (decreasing prevalence): hematomas, lacerations and swelling, and skull fractures. Of the injuries, bruises were the most common (33%) followed by fractures and joint injuries (25%).

The largest and most detailed study examining the types of injuries that children sustain when being abused was reported by Becker et al. (1978).⁵⁷ The medical records of 260 cases of child abuse admitted to The Children’s Hospital in Boston between 1970 and 1975 were reviewed. One hundred and twenty-eight (49%) of the patients had facial and/or intraoral trauma. An additional 16% of the children had injuries to the head, such as skull fractures, subdural hematomas, contusions, and lacerations of the scalp. This brought the total of head/face/intraoral injuries to 65% of the abused children in the study. Of the 386 injuries sustained by the 260 children (Table 1), 33% were to the head, 61% to the face (contusions, ecchymoses, abrasions, lacerations, fractures, burns, and bites) and 6% to intraoral structures. The single most common type of injury was a facial contusion which occurred twice as often as the second most common injury, contusions to the body or organs. In 45% of the cases, the head injuries were severe enough to be the reason for admission to the hospital.

TABLE 1. Types and Locations of Injuries in 260 Abused Children

| Location | Fractures | Subdural Hematoma | Abrasions and Lacerations | Contusions and Ecchymoses | Burns | Bites | Dental Trauma | Miscellaneous | Total |
|--------------|-----------|-------------------|---------------------------|---------------------------|-------|-------|---------------|---------------|-------|
| Head (scalp) | 33 | 23 | 6 | 14 | 0 | 0 | 0 | 1 | 77 |
| Face | 3 | 0 | 40 | 96 | 4 | 2 | 0 | 0 | 145 |
| Intraoral | 0 | 0 | 4 | 6 | 0 | 0 | 4 | 0 | 14 |
| Body (organ) | 38 | 0 | 20 | 52 | 25 | 6 | 0 | 9 | 150 |

Reprinted from Becker DB, Needleman HL, Kotelchuck M: Child abuse and dentistry; orofacial trauma and its recognition by dentists. *J Am Dent Assoc* 97:24-28, 447, 1978.

Malcez (1979) cited 25 cases of suspected abuse reported by pediatric dentists.⁵⁸ The principal dental injuries reported in these cases were: fractured teeth, 32%; oral lacerations, 14%; fractures of the maxilla or mandible, 11%; and oral burns, 5%.

The literature contains numerous reports and articles documenting bite marks in child abuse and the role the dental profession plays in using this information. This topic is dealt with in detail by Dr. Wagner in this issue. Bite marks can help to identify the abuser.

In summary, studies demonstrate that: (1) trauma to the head and associated areas occurs in approximately 50% of the cases of physically abused children; (2) soft tissue injuries — most frequently bruises — are the most common injury sustained to the head and face and are the single most common injury sustained in child abuse; and (3) injuries to the upper lip and maxillary labial frenum may be a characteristic lesion in the severely abused young child.

These findings make it obvious that dentists are in a position to detect child abuse. National figures indicate that as many as 1 million (625,000 substantiated) children are abused and/or neglected annually and of these about 1000 die each year.⁵⁹ If we assume that half of these cases involve trauma to the head, as is indicated in the literature, our profession is definitely in a position to detect substantial numbers of abused children. In this way we can help to prevent further trauma to the children by bringing help to these troubled families.

The Dentist's Involvement in Reporting Child Abuse

There are numerous reports of abused children in the dental literature in which the dentist was the professional who initially suspected that injuries involving the orofacial structure were the result of physical abuse.⁶⁰⁻⁶⁸ Such children first were treated and subsequently reported to appropriate agencies. Most of the cases cited were instances of severe child abuse resulting in hospital admission or death and involving the head and orofacial areas. It can be as-

sumed, then, that less severe abuse cases may be appearing in medical and/or dental office settings. One may hypothesize that these cases of abuse resulting in less serious injuries may go undetected by the dentist or physician due to lack of suspicion and/or knowledge of child abuse and neglect. Several studies have been published which address the issues of how frequently dentists actually are involved in child abuse reporting and the extent of their knowledge of child abuse and neglect.^{57-58,69-72}

The first evidence of a lack of reporting of child abuse by dentists appeared in the *Journal of the American Dental Association* in 1967.⁶⁹ In this article, reports of child abuse in New York and Illinois were documented. During 1966 in New York, 416 cases of suspected child abuse were reported: 85% of these reports came from hospitals, 12% from physicians, and no reports came from dentists. Illinois records indicate that 934 reports of child abuse were received between 1965 and 1967, only 1 of which was from a dentist.

It was not until 1978 that a large-scale study investigating the dentist's involvement in child abuse reporting was completed. Becker et al. (1978) sent questionnaires to all pediatric dentists, all oral surgeons, and one-third of all general dentists in the Commonwealth of Massachusetts.⁵⁷ Based on 537 responses, the following observations were made (Table 2).

1. Eight per cent of all dentists responding saw suspected cases of child abuse (22%, oral surgeons; 18%, pediatric dentists).
2. Of the 22 suspected cases of child abuse seen, only 4 cases actually were reported. The main reason cited for nonreporting was that it was difficult to confirm these suspicions.
3. Only 45% of dentists were aware of their legal responsibility to report instances of suspected child abuse (77%, pediatric dentists; 62%, oral surgeons).
4. Only 28% of dentists knew the name of the agency to which to report these cases.
5. Although oral surgeons and pediatric dentists rep-

TABLE 2. Legal and Agency Awareness of Dentists and Cases Seen

| | Overall | Oral Surgeons | Pediatric Dentists | General Dentists Other Specialists |
|----------------------------------|---------|---------------|--------------------|---------------------------------------|
| Total | 537 | 73 | 39 | 425 |
| Legal awareness | 242 | 45 | 30 | 167 |
| Agency awareness | 149 | 26 | 21 | 102 |
| Dentists seeing orofacial trauma | 403 | 69 | 35 | 299 |
| Suspicious cases | 45 | 16 | 7 | 22 |
| Definite cases of abuse | 22 | 7 | 6 | 9 |
| Reported cases | 4 | 1 | 2 | 1 |

Reprinted from Becker DB, Needleman HL, Kotelchuck M: Child abuse and dentistry; orofacial trauma and its recognition by dentists. J Am Dent Assoc 97:24-28, 447, 1978.

resented 15% of the respondents to the questionnaire, they saw 41% of the suspected cases and 59% of the definitive cases of child abuse.

Davies et al. (1979) analyzed the reporting of child abuse and neglect cases brought to the attention of a child abuse service office over a 4-month period.⁷⁰ This office received approximately 400 referrals per month and none were reported by dentists. They conservatively estimated that of these cases, approximately 12.5% definitely had to involve traumatic injuries to the head and neck areas.

Malcez (1979) sent questionnaires to the Diplomates of the American Academy of Pediatric Dentistry to investigate their experience with child abuse and neglect.⁵⁸ Of the 156 respondents, 25 (9%) had filed reports of child abuse and neglect. Most of the pediatric dentists only had filed a single report, but a number of them had reported as many as 6 cases. Eleven per cent of these dentists said that they knew of other dentists who had reported cases of child abuse. Only 7% of the respondents felt that they were adequately trained in the recognition and reporting of child abuse, and only 56% knew of the proper procedure for reporting in their state.

Blain et al. (1979) demonstrated that when a dentist participates in a child abuse and neglect team, the number of cases reported by dentists can increase.⁷¹ Of the 156 cases of child abuse and neglect referred to the UCLA-centered Suspected Child Abuse and Neglect (SCAN) team in 1978, only 1 case had been reported by a dentist. With the subsequent participation of a dentist on this team, the number of suspected cases of child abuse reported by a dentist increased to 5 within the first month.

Blain et al., (1982) performed a retrospective analysis of reporting frequency of suspected child abuse and neglect cases in a large metropolitan area.⁷² They used the records of 3 major metropolitan hospitals and state and local police reports of child abuse and

neglect. Of 1276 cases diagnosed as child abuse and neglect, dentists were only responsible for referring 1 to the hospital, 1 to local police, and 5 to state registries.

These surveys clearly demonstrate that dentists: (1) do see suspicious cases of child abuse; (2) often fail to report their suspicions as is legally required; (3) do not have adequate training or knowledge of child abuse and neglect; and (4) report more cases if made aware of child abuse and neglect and their responsibility to report.

Treatment of Orofacial Injuries in Child Abuse

The primary goal in the detection of child abuse is to prevent further injury to the child by bringing needed social services to the family. Since injuries to the orofacial structures are common in cases of child abuse, any such injury should cause the dentist to suspect the possibility of nonaccidental origin. In an attempt to confirm or rule out the possibility of child abuse, several questions should be considered.

1. Is the injury consistent with the history given and/or is it unusual for that specific age group? For example, it has been shown that 80% of all children who fall out of bed sustain *no* physical injuries.⁷³ In this study, 19% had slight bruises or lacerations, and only 1% had skull fractures; *none* had subdural hematomas, epidural hematomas, or any serious life threatening injuries. Therefore, if this type of accident is given as the cause of severe orofacial injury the dentist has reason to suspect abuse.
2. Is there any history or are there signs of repeated or previous trauma?
3. Are there any cutaneous manifestations strongly suggestive of abuse; e.g., multiple bruises in various stages of healing?^{74,75}
4. Does the parent or child exhibit any unusual

behavior which might indicate abuse; e.g., an exaggerated or detached response to questioning?

5. Is there any evidence of neglect or poor supervision of the child?

As with any orofacial injury and especially in cases of suspected child abuse, a neurological assessment should be made initially. Croll et al. (1980) described a rapid, systematic, and meaningful neurological assessment for dentists which is essential in these cases.⁷⁶ This assessment includes: observing the child's communication and motor skills; patency of airway; obtaining a history of any loss of consciousness, cyanosis or seizure activity; obtaining vital signs; observation for signs of rhinorrhea or otorrhea; rapid testing of the cranial nerves; and alerting the parents to the possible signs of neurological damage.

Needleman (1984) described the approaches for management of orofacial injuries in suspected cases of abuse.⁷⁷ If the initial examination reveals any positive signs of neurological damage or other injuries beyond the scope of the attending dentist, an appropriate referral should be made. In instances of severe trauma to the jaws, alveoli, or intraoral soft tissues, an oral and maxillofacial surgeon is best qualified to provide treatment. Facial lacerations requiring extensive suturing might best be treated by a plastic surgeon. Unfamiliar oral lesions can be referred to an oral pathologist or oral surgeon. Trauma to the body possibly involving internal organs, to the head involving the CNS, or to the extremities always must be evaluated further by a physician. These professionals should be made aware of your suspicions so they also can be sensitive to and helpful in confirming the possibility of abuse. The initial orofacial injuries accompanying these signs and symptoms must be treated, the referrals must be made and carried out *before* discussing the issue of child abuse with the parents or guardian, since referral recommendations and follow up can be jeopardized if the parents or guardian feel threatened.

If the initial examination reveals trauma limited to the oral cavity and treatment is within the scope of the attending dentist, definitive treatment should commence. When treatment is completed, the dentist should discuss with the accompanying adult the treatment rendered, prognosis, necessary follow-up care and the symptoms of more serious head injuries (Appendix). Once this has been accomplished, the issue of suspected child abuse should be discussed.

Prior to rendering specific treatment modalities, some general treatment considerations should be reviewed. Is the child old enough and/or mature enough to cooperate? Ideal treatment may have to be compromised or modified with an unmanageable child.

Use of sedative premedication, nitrous oxide/oxygen analgesia, and/or the use of physical restraints such as a Papoose Board^a may be essential for managing the very young or very apprehensive patient. Parents or guardians should not be present in the room during treatment as their presence may hinder communication with the distraught child.

The attitudes of parents or caretakers toward dental care are sometimes a factor in treatment decisions. In cases in which child abuse is suspected, parental input might not be sought. Treatment approaches with the best prognoses should be selected since risky and/or complex procedures can increase the chance of failure and are often dependent on faithful parental follow-up.

Treatment considerations also should include: (1) space maintenance of primary units; (2) root development of involved teeth; (3) coronal development of the succedaneous teeth; (4) dental occlusion; and (5) medical status. Each of the variables can affect the treatment modalities selected.⁷⁸

The patient's immunization status for tetanus must be ascertained. Primary immunization is achieved through the normal series of 3 DPT injections during childhood. An additional booster is recommended, preferably when beginning school. Booster doses must be considered in wound management. After 4 doses of tetanus toxoid, antitoxin persists at protective levels for at least 10 years for clean, minor wounds or 5 years for all other wounds, and an ability to react promptly to a booster infection persists for a longer time. Therefore, in wound management it is not necessary to give booster injections more frequently than every 5 years.⁷⁹ Table 3 outlines recommended booster

TABLE 3. Guide to Tetanus Prophylaxis in Wound Management

| History of Tetanus Immunization (doses) | Clean, Minor Wounds | | All Other Wounds | |
|--|------------------------|------|---------------------|------|
| | Td* | TIG# | Td | TIG |
| Uncertain | Yes | No | Yes | Yes |
| 0-1 | Yes | No | Yes | Yes |
| 2 | Yes | No | Yes | No + |
| 3 or more | No ^ | No | No | No |

* Tetanus and diphtheria toxoids

Tetanus immune globulin

+ Unless wound is more than 24-hr old

^ Unless more than 10 years since the last dose

| Unless more than 5 years since the last dose

Reprinted from American Academy of Pediatrics: Report of the Committee on Infectious Disease, 19th ed. Evanston, Illinois, 1982, p 262.

^a Olympic Papoose Board — Olympic Surgical Co: Seattle, WA.

doses according to immunization status and wound risk level.

Soft Tissue Injuries

Contusions and ecchymoses are best treated with ice packs to accessible areas for the first 24 hr. This results in local vasoconstriction and minimizes the flow of blood to the traumatized area. In instances of extensive swelling, pressure dressings may be helpful. Later in the course of treatment, applications of warm packs help resolve extravasated blood in the tissues. It is important to note that these lesions are often a diagnostic sign of possible underlying or related bony fractures; e.g., a contusion in the floor of the mouth often signals a fracture of the mandible.

Treatment of abrasions primarily consists of careful cleansing of the wound. Gentle irrigation of the wound with warm water and soap helps to remove dirt and foreign material. The wound then is irrigated with copious amounts of normal saline and the surrounding skin is prepared with an antiseptic solution. If foreign material still remains, cleansing with a brush and surgical soap may be required along with the removal of individual debris with a sterile cotton tip, tissue forcep, or the tip of a #11 scalpel. Placement of a sterile dressing or gauze over the wound helps to protect the wound from further irritation and promotes healing. The dressing should be changed daily until the wound is healed.

In small and medium frenum tears, suturing is usually not necessary since healing will be satisfactory with secondary intention. However, if the wound is large, the alveolar bone is exposed, and/or the wound separates when the lip is pulled upwards, suturing is required.

It is essential to use local anesthesia in managing any lacerations in children. When possible, regional block anesthesia should be used to avoid distortion of wounds. As with abrasions, one should be alert for foreign bodies within a wound. It is not uncommon for tooth fragments to be present. Appropriate soft tissue radiographs should be taken to rule out this possibility when the child sustains fractured teeth with lacerations. Following debridement, the wound should be explored to delineate its anatomy and to assess any damage to nearby structures such as a parotid duct or gland, Wharton's duct, or a facial nerve. Only obviously nonviable tissue should be excised. It is best to use 5-0 or 6-0 nylon or silk sutures for skin suturing, 3-0 or 4-0 chromic gut sutures for repairing the musculature such as the lip or tongue, and 4-0 or 5-0 plain gut sutures for mucosal closures. Suturing is done in layers, starting from the inside and moving to the outside. Interrupted suturing should be used, placing the sutures no farther than 2.5 mm apart. Nonresorbable sutures should be re-

moved 4 days after placement. Dry wounds can be dressed with steri-strips and draining wounds can be covered with gauze. The use of prophylactic antibiotics is recommended and penicillin is the drug of choice.

Puncture wounds are treated similarly to lacerations. The wound must be cleansed, the damage assessed, and, if large enough, the puncture must be sutured in layers. Small punctures can be left to heal by secondary intention, especially in areas such as the palate.

Human bites must be regarded as serious injuries since devastating complications can result if proper treatment is not rendered. Frequently reported complications include recurrent infections, permanent joint stiffness, osteomyelitis, and digital amputations. Less frequent are extremity amputations, systemic sepsis, and death.⁸⁰ The wound first should be cleansed, debrided if necessary, and then left open. Administration of tetanus toxoid is recommended according to the previously described protocol. *Staphylococcus aureus* is the organism most frequently encountered in human bite wound infections, although other strains have been implicated.^{80,81} Antibiotics recommended include cephalosporin, penicillin, or clindamycin.

Minor bite wounds can be treated as traumatic ulcers with topical protectants. A corticosteroid such as triamcinolone, when added to the protectant can help control resultant inflammation.

Burns to the orofacial structure are not uncommon. They may be classified as electrical, thermal, or chemical.

The etiologic, histologic, and clinical features of electrical burns have been well reviewed.⁸² Minor electrical burns can be treated conservatively by repeated applications of topical antibiotics. They heal with little deformity. Tetanus toxoid should be administered if the patient is in need of a booster.

Major electrical burns require hospitalization because severe complications often occur. These include fluid loss, poor nutrition, and shock, as well as secondary hemorrhage from the labial arteries that may occur 3-4 days after injury. Careful daily debridement is necessary to remove necrotic tissue and stimulate the formation of healthy granulation tissue. Adhesive strips can be used for good approximation of wound edges and manipulation of muscle pull. Home care should include frequent saline rinses and massaging burned tissue to increase blood supply. Many electrical burns require surgical repair, but the exact timing of the repair has been controversial. A delayed or conservative approach to the management of the acquired oral deformity now is recommended.⁸³⁻⁹⁰ Several recently published articles recommended that intraoral acrylic splints with extraoral extensions be inserted soon after the trauma.⁹¹⁻⁹⁸ This

appliance has proven successful in minimizing the contraction of the commissure, a long-term sequela of electrical burns to the mouth.

Thermal burns involving small portions of the face should be referred to a physician. The wound usually is covered with sterile dressings and needs to be inspected every 3-4 days for healing progress and signs of infection. Antibiotics should be applied during the healing process, but greasy ointments should be avoided. Extensive second- or third-degree burns of the face are best referred to a hospital burn center.

Ulcerations of the oral mucosa that occur as the result of thermal injuries usually heal uneventfully.⁹⁹ The ulcerative area should be kept covered with a thick paste. Topical steroids, such as triamcinolone in an adhering paste can be helpful for healing and pain control. Complete healing of an ulcerative area caused by a thermal burn usually takes 2-3 weeks. Systemic analgesics may be helpful for 1-2 days following the injury.

Chemical agents accidentally or intentionally placed in the mouth result in severe and acute trauma to the oral mucosa.¹⁰⁰ A white slough forms representing necrotic epithelium. As the slough is rubbed off, a bleeding, raw, and painful area is exposed. Caustic or corrosive burns of the mouth can result from ingesting liquid or solid (granules or powder) forms of alkalines or acids.

Symptoms from burns of the oral cavity occur immediately and range from minor discomfort to severe pain. Extensive burns, however, may destroy mucosal nerve endings and produce anesthesia. Excessive salivation, drooling, and dysphagia occur due to irritation of oral and esophageal mucosa. Examination of the mouth may show edema, inflammation, and/or whitish areas. The presence of oral burns only documents exposure to a caustic agent and does not predict accurately the presence or absence of esophageal burns.

Immediate treatment consists of flushing the caustic substance off the skin or mucosa with copious amounts of water. Neutralizing the caustic agent may produce heat and is no longer recommended.

Injuries to the Dentition

The pediatric dentist is well acquainted with the management of injuries to both the primary and permanent dentitions. In cases of suspected child abuse, follow-up dental care may not be possible due to the lack of familial compliance and/or delays in the disposition of the case by the investigating agency. Thus, treatment of dental injuries needs to be as definitive as possible. For example, teeth with Class II fractures should be restored at the emergency visit to their original size and shape using the acid-etch technique and the appropriate resin material. The same ration-

ale would apply to Class III fractures. To decrease chances for failure and the need for careful follow up, one should consider definitive 1-stage pulp therapy (i.e., pulpectomy and gutta-percha obturation) for these pulpal exposures. Obviously, many other types of injuries require repeated appointments for treatment and/or observation and this must be made known to the individual who will be investigating the case.

Injuries to the Facial Bones

Facial fractures are relatively uncommon in children. They can, however, occur during physical assault with nasal fractures occurring most frequently (45%), followed by mandibular fractures (32%), and zygomatic maxillary complex and orbit fractures (20.5%).¹⁰¹ Initial management of facial fractures requires attention to basic life-support means, such as airway maintenance, control of bleeding, and fluid management. Sedation of the young patient may be necessary to fully evaluate the fracture both clinically and radiographically. Temporary stabilization of the fracture is often helpful in controlling pain during acute stages. Proper bandaging (i.e., using Barton's bandage) of the facial bones can provide support and help to sedate the patient before he/she is transferred into the care of an oral and maxillofacial surgeon.

Diagnosis of mandibular fractures usually can be made by clinical examination. The fracture appears as an irregularity in the mandibular arch, with loss of proper dental occlusion, and with occasional tears in the oral mucosa. Mandibular fractures most commonly occur in the bicuspid area. Active treatment is not necessary if there are no signs of displacement. Often there is little discomfort with these injuries. A soft or liquid diet should be prescribed for 4 weeks, allowing time for sufficient union so that the patient can eat normally. If displacement is evident and teeth are adjacent to the fracture site, interdental wire fixation can be undertaken. If no teeth are present, stabilization of mandibular fractures may be accomplished by open reduction.

Mandibular fractures also can occur in the subcondylar region. These often cause pain and tenderness in the TMJ region as well as considerable trismus and displacement of the lower dental arch. Active treatment of such fractures is seldom necessary, but referral to an oral and maxillofacial surgeon is mandatory for further evaluation and follow up. A comprehensive discussion of the definitive management of facial fractures is presented elsewhere in the literature.¹⁰²

Conclusions

This article has shown that dentists need to be alert to the possibility that orofacial trauma may be the

result of child abuse. By heightening the dental profession's awareness of this issue, child abuse detection will increase. This will help to insure that these troubled families will receive the appropriate social services, thus preventing further physical and psychological trauma to the child.

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Appendix

Instructions to Parents Concerning Head Injuries

Your examining physician considers it safe for your child to return home. Although your child has been examined thoroughly for evidence of head injury, certain signs of trouble may appear in the next 48 hours. Please observe your child carefully and telephone us should any of the following signs appear. Be sure your examining physician explains them to you and answers your questions before you leave the hospital.

Signs of Trouble

- 1. Excessive Drowsiness**
Your child may well be exhausted by the ordeal surrounding the injury, but should be awakened easily by methods that you would ordinarily employ to awaken him from a deep sleep. If you cannot do this, notify the hospital.
 - 2. Persistent Vomiting**
Children will, in most cases, vomit 1 or more times following a severe head injury. Should the vomiting recur more than once or twice, or should it begin again hours after it has ceased, notify the hospital.
 - 3. If one pupil appears to be larger than the other, notify the hospital.**
 - 4. If the child does not use either arm or leg as well as previously, or is unsteady in walking, notify the hospital.**
 - 5. Should speech become slurred or the child be apparently unable to talk, notify the hospital.**
 - 6. If severe headache occurs, particularly if it increases in severity and is not relieved by aspirin, notify the hospital.**
 - 7. Should the child complain of "seeing double" or should you detect any failure of the eyes to move together appropriately, notify the hospital.**
 - 8. Should a convulsion occur, place the child on one side and where he cannot fall, be sure there is ample room for him to breathe, placing a firm object between the molar teeth to keep mouth open. Stay with the child until the convulsions begin to subside, and notify the hospital as soon as possible.**
- On the night following the head injury, or during any nap, it is advisable to awaken your child (every 3 hr) and look for any of these danger signs.

Reproduced from "Emergency Room Information", The Children's Hospital Medical Center, Boston, Massachusetts.