

## Causes of Dental Sensitivities in Children

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### Abstract

Tooth sensitivity in children usually does not occur because the child does not brush his teeth properly for many years, but the most common cause of tooth sensitivity in children is tooth decay. Tooth fractures, the habit of grinding or pressing teeth together (bruxism), oral habits, or tooth irregularity of teeth can cause small fractures in the tooth structure that may lead to tooth sensitivity. The old restorations or fractured restorations could be the other causes of tooth sensitivity that should not be passed by.

**Keywords:** *Dental Caries; Tooth Sensitivity; Tooth Fracture; Bruxism; Old Restoration; Tooth Irregularity; Oral Habits*

### Introduction

Parents of a child should know well what tooth sensitivities are so they can solve this problem in their children if necessary. If the child has tooth and gum sensitivity, it could be due to one of the followings: When children lose their primary teeth, the emergence of new teeth can be painful and uncomfortable. But while the eruption of baby teeth on its own can be painful for the baby, in practice what causes tooth sensitivity is the contact of air and food particles with these new teeth. Once the teeth have adapted to the new mouth environment, their discomfort and sensitivity will diminish.

Amalgam restorations can become a factor in tooth sensitivity to heat and cold due to the high thermal conductivity of metals [1]. Therefore, if the child has already filled his teeth, his pain and discomfort can be due to the same filling.

Sinus problems and allergies can make children feel similar tooth sensitivity. The cause of this pain and discomfort is due to the high pressure that enters the face and mouth of the child as a result of these complications [2-5].

### Causes

As adults, we sometimes could not stand the severe pain of sensitive teeth. So of course for a child, a toothache cannot be tolerated at all. In addition, it is very difficult to diagnose in children whether the pain is due to tooth sensitivity or is caused by another factor. Now how do we know if a child has dental sensitivities? Tooth sensitivities in children can have many causes. By knowing the causes of tooth sensitivity, mothers can help prevent this problem and treat it faster if it occurs. If hot, cold, or very acidic foods and drinks, or breathing in cold weather cause the child to have tooth pain and discomfort, the child may have tooth sensitivity. Dental sensitivities may go away over time and recur later. Some of the most common causes of these sensitivities in children are discussed below.

**Improper way of brushing:** Children usually do not pay much attention to the way they brush. Some children brush their teeth too hard, causing their enamel to wear away and their gums to become damaged, resulting in tooth sensitivity. Therefore, parents have to teach

their children how important proper brushing is in oral health. On the other hand, excessive brushing and the use of toothbrushes with hard bristles can also cause the enamel to wear out and more dentin to appear and become more sensitive [6,7]. But using a soft toothbrush and slow circular movements of the toothbrush can help protect the enamel in the future.

One study shows the probable associations between tooth erosion and tooth brushing habits [8].

**Tooth decay:** Children are usually more at risk for cavities and pores caused by dental caries. When the dentin is invaded by bacteria and loses its protective layer, heat, cold, acidic, or sticky foods infiltrate the dental tubules and cause stimulation of the nerve endings. Consequently, it may cause hypersensitivity and discomfort when children chew, drink cold or hot liquids, or even breathe.

**Bruxism:** Most children have a habit of grinding their teeth. Bruxisms cause severe erosion of the enamel leading to the appearance of the dentin layer, and eventually tooth sensitivity in the child [9,10]. Attrition on the cusps of posterior teeth might be visible [10].

**Tooth fracture:** The habit of grinding teeth can cause children's teeth to break [9-11]. Some children even have crooked teeth due to teeth irregularities or jaws malformations. Children with tooth fractures may experience pain and discomfort when eating or chewing food.

**Sinus problems:** Children who suffer from chronic sinusitis may rarely have tooth sensitivities. The cause of this pain and discomfort is due to the high pressure that is applied to the face and mouth of the child which resembles the sign and symptoms of tooth sensitivity [12]. One study reveals that sinusitis can cause direct stimulation of teeth due to the proximity of the superior alveolar nerve to the maxillary sinuses [13]. But note that the connection between this disease and tooth sensitivity must be properly identified.

**The emergence of new teeth:** All children at some point in their childhood or adolescence eventually lose their primary teeth. But when new teeth appear, they can cause a lot of pain and discomfort to the baby. If the air contact with the erupted teeth causes the child to feel pain and discomfort, he or she may have tooth sensitivity.

**Dental fillings:** Children who have previously had tooth restorations may have dental sensitivities due to the high thermal conductivity of the materials used to fill teeth.

In other words, this pain may be concerned with the high thermal and electrical conductivity of dental materials such as amalgam or composite resins that are used for tooth restoration [14].

**Pediatric orthodontics:** Children who have orthodontic brackets in their mouths cannot brush easily. Therefore, when brushing, they may move their toothbrush back and forth very tightly, causing the enamel to wear away. Over time, tooth decay will cause tooth sensitivity in the child.

**Plaque formation on teeth:** The formation of bacterial plaque on tooth surfaces can cause their sensitivity. Dental caries in a young child can quickly lead to pain and dental sensitivity due to enamel damage caused by plaque accumulation and gingival recession [15].

**Sour and acidic foods:** In children who consume acidic foods such as citrus fruits, tomatoes, etc., high levels of acidic substances in the mouth can cause erosion of tooth enamel and eventually tooth sensitivity.

### Treatment of tooth sensitivity in children

Tooth sensitivity or dentin sensitivity is exactly what it looks like to have pain or discomfort on the teeth in response to a specific stimulus such as hot or cold temperatures. It can be a temporary or permanent problem and can affect one, several, or all of a person's teeth. This complication can have many causes, but most cases of dental sensitivities can be easily treated by changing oral hygiene and diet:

- After new teeth eruption, massaging the baby's gums in one direction could relieve the pain a bit. Another way to relieve gum pain in the stage of teething is to give the child dental toys to play with. Cold tooth rings are very helpful in reducing gum pain in children [10].

Even though topical medications such as anesthetic gels and creams are great for relieving gum pain when teething but the FDA warns about using teething gel in newborns. FDA does not approve lidocaine gel for children under age two. FDA believes the accidental ingestion of this drug leads to complications such as serious brain damage and heart problems in newborns [10,16-18].

- The child should be taken to the dentist regularly and periodically to treat small caries in his teeth before it becomes a bigger problem. If the child is experiencing a toothache or tooth sensitivity, it is strongly emphasized to see a dentist sooner, even if it is not yet scheduled for a routine visit of a dentist.
- The fluoride toothpaste should be used for the child, and parents should monitor their brushing to make sure it is brushing properly.
- Eating sugary and high-sugar foods between main meals is not recommended. Foods such as fruit juices, sugary drinks, energy drinks, and sports drinks can be very harmful to a child's teeth as well as to their general health [19-24]. In general, sugar and sugar should be eliminated from the baby's diet as much as possible.
- Broken or cracked pieces of teeth should be preserved as much as possible. The dentist may be able to attach the fracture in place. Otherwise, the broken tooth is usually repaired by bonding with a tooth-colored composite material.
- If the child is unable to close his or her mouth normally or bite into food due to a broken tooth, parents should be contacted by the dentist as soon as possible. The use of painkillers and a good night's sleep can often make the treatment of a broken tooth much easier and more bearable for the child.
- The broken tooth should not be shaken or the broken piece removed. Also, the child should not bite something with a broken tooth, as this can make the problem worse.
- It is perfectly normal for a tooth to become sensitive after filling, but it is not at all normal for the sensitivity to get worse. A dental sensitivity that gets worse over time is a sign that there is a problem with the filling, and the child should see a dentist as soon as possible to determine the cause and correct it. The filling may be replaced, or the decay may be too deep and require pulpotomy.
- Taking antibiotics as prescribed by a pediatrician, acetaminophen for relieving pain, and a decongestant such as Children's Sudafed or Guaifenesin intended to help cough out phlegm from the airways can help treat sinusitis in children [25-28]. Also, placing a cold humidifier in the child's room can be effective. To reduce sinusitis, a nasal spray is recommended [25,26].
- Learning how to brush properly can reduce the risk of developing this type of tooth sensitivity in a child. Parents should teach their children to brush with gentle rotational movements and not move them back and forth firmly [29,30]. In this way, the enamel of the baby's teeth is better preserved, and as a result, it protects the dentin and the root of the tooth more.
- The appearance of dentin is a factor that causes tooth sensitivity in patients going under orthodontic treatments [31,32]. If children have orthodontic brackets in their mouth, brushing them properly is much more important to them. Because when orthodontic brackets are in a child's mouth, he or she subconsciously brushes more under the gum line. If the child does this with a lot of force and moving the toothbrush back and forth, may damage the health of the gum line and cause dental sensitivities in the future [29].

For children under orthodontic treatments, food particles could be accumulated between their teeth and brackets if the area is not brushed properly. Hence, plaque accumulation around the brackets could cause tooth caries, gingival inflammation, gum recessions, and leads to tooth sensitivity.

### Other treatments for dental sensitivities

Although many factors can cause tooth sensitivity in children, fortunately, there are several treatment options based on the cause are discussed below.

### Application of toothpaste for sensitive teeth

These types of toothpaste contain compounds that can block pores that extend from the tooth surface to the root of the tooth. To reduce tooth sensitivity, this type of toothpaste should usually be used several times. After using it several times, the pores on the tooth surface may close and the tooth sensitivity disappears.

### Fluoride therapy (fluoride gels)

The use of fluoride gels or fluoride therapy is a simple dental procedure performed in the office that increases the strength of the enamel and relieves pain and sensitivity. Fluoride increases the strength of tooth enamel and reduces the risk of caries spreading to deeper layers [33-36].

Petersson shows the partial or total obstruction of dentin tubules and reduction of dentin and enamel hypersensitivities and tooth wear by using fluoride treatment [36].

The mechanism action of fluoride is to reduce and block fluid movements in the dentin tubules by the formation of calcium-phosphorous as well as calcium fluoride (CaF<sub>2</sub>) and Fluorapatite (FAp) which leads to diminishing tooth hypersensitivity [37,38].

The use of special treatments, such as fluoride gels or foams, is usually only necessary if the child's risk of tooth decay and sensitivity is too moderate.

### Crowns

If the child's first molar teeth have already been damaged and filled in two layers for restoration, that tooth may decay again or the filling may break due to tooth deformation. In such cases, it is necessary to cover the tooth with a special coating made of stainless steel. Another way to treat this complication is to remove the damaged tooth and replace it with a retainer to maintain enough space for the permanent tooth to grow in the future. SS crowns are in the form of silver-colored caps that cover the entire surface of the tooth and prevent tooth sensitivity due to fracture. Ceramic crowns are another type that is similar in color to the tooth itself. Pediatric crowns are usually done in just one session, and they will last until about the age of 12 when the primary teeth fall out.

If the child is not accustomed to cleaning and maintaining good dental hygiene, his teeth will decay and the enamel will disappear. In this case, when the child's teeth come in contact with toothbrushes or hot and cold foods, he feels severe pain and sensitivity. To treat this complication, it may be necessary to use an inlay to repair the decay that has caused tooth sensitivity.

### Bonding

Fractures of a child's teeth as a result of injuries sustained while playing or biting on objects and very hard food can also cause dental sensitivities. The reason is that bacteria can enter the dentin from the fracture site and cause irritation and sensitivity. When dentin is

exposed due to enamel abrasion, the Invasion of bacteria to dentinal tubules occurs. Bacterial products infiltrate through the dentinal tubules and cause inflammatory changes in the pulpo-dentin complex [39]. In such cases, bonding is usually used to repair the fracture or crack that caused the tooth to become sensitive. The management strategies are associated with the diagnosis including the use of desensitizing pastes and resin bonding agents to direct restorations [40].

### Gingival graft surgery

If the tooth sensitivity is due to the recession of gingival tissue and the appearance of tooth roots (due to trauma or other factors), gingival graft transplantation [41] or Guided tissue regeneration [GTR] [42] can be used to repair gingival tissue and reduce tooth sensitivity.

### Root canal therapy

If none of the above treatments are effective in relieving tooth sensitivities, an Endodontist may eventually recommend root canal therapy for the child which is known as the most successful method in relieving severe dental sensitivities.

### Persuasion of the children to take proper care of their mouth and teeth

In addition to various treatments such as fluoride therapy, encouraging the child to maintain good oral hygiene and dental care can also help reduce and treat your child's dental sensitivities. While pediatric dentists provide health advice in the office, this task is up to the parents to try to teach their children the correct way to brush their teeth. Brushing twice a day and flossing every day keeps a child's teeth and gums clean and healthy and reduces the risk of tooth decay and gum disease. Also, using soft-bristled toothbrushes reduces the risk of damaging the baby's gums and teeth and the risk of tooth sensitivities.

### Summary

Tooth sensitivity can be described as a feeling of pain and discomfort that occurs immediately after the tooth is exposed to stimuli. Sensitive teeth can be annoying and painful. In practice, a variety of factors, from certain foods to improper brushing, can cause tooth sensitivity, so that very soon it can turn from minor discomfort to a big problem. Tooth sensitivity can be caused by various diseases and problems with the teeth, including genetic problems. After the source of stimulation is removed, the toothache can be relieved.

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