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| **Name:** |
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| **Pathology Question:** |
| What is the etiology of anterior open bite? |
| **Report:** |
| Anterior open bite is a condition in which there is no vertical overlap (overbite) between the incisors when posterior teeth are in occlusion. This open bite can have esthetic as well as functional consequences, such as difficulties in incising food, speaking, or possible trauma to the posterior teeth. The etiology of this condition is multifactorial, with possible causes stemming from habitual, skeletal, dental, respiratory, and neurologic contributions. Identifying the cause of the open bite is crucial for treatment planning because treatment could be unsuccessful if the cause is still ongoing, which contributes to the high relapse rate of this condition.  Broadly, the causes of anterior open bite can be divided into dental and skeletal, though there can often be a contribution from both. Dental causes are those in which there is a physical block preventing the normal vertical development and eruption of the anterior teeth. Teeth will erupt until something stops their eruption, and several things could be the culprit, which are often some form of habit. A common cause is thumb or finger-sucking, or using a pacifier, which can prevent the normal eruption of the teeth. These sucking habits could be followed by a tongue-thrusting habit, in an attempt to create an anterior seal to allow negative pressure while swallowing. A tongue-thrusting habit could also occur unknowingly in an attempt to protect a tooth with premature contact, to create an oral seal in response to incompetent lips, or as a result of a neurologic condition like cerebral palsy, any of which can lead to an anterior open bite. Another soft tissue habit that can lead to a minimal anterior opening is lip-sucking. The lower lip is often involved, and it is usually in response to a posterior interference. Other habits like pipe smoking or pencil chewing can also prevent the eruption of teeth and cause a localized anterior open bite. Identifying these habits as contributing to the open bite is important because if the open bite is corrected while the habit persists, the condition will likely relapse.  A skeletal open bite is another cause of anterior open bite in which there is a discrepancy of the vertical component of growth exceeding the horizontal component. Cephalometric measurements can help diagnose a skeletal open bite, with common cephalometric features being increased lower anterior facial height, increased antegonial notching, reduced inter-incisal and inter-molar angle, short mandibular ramus, increased posterior dentoalveolar height, and recessive chin. With this increased vertical dimension, the anterior teeth may not be able to compensate with eruption, leaving an open bite. Mouth breathing from a respiratory issue can potentiate this increased vertical height, and respiratory issues that are associated include tonsillar or adenoid obstruction, inadequate nasal airway, allergies, or nasal septum or turbinate problems. Skeletal open bites can usually be successfully treated as the cause is not persisting like a habit-derived cause. Other non-habit causes of anterior open bite include crowding of the teeth, giving them a labial inclination, or TMJ deformations, such as can occur with rheumatoid arthritis for example.  There are a variety of treatments approaches possible to correct an anterior open bite. These include functional therapies to eliminate habits, various fixed appliances, and orthognathic surgery, among others. Identifying the cause of the open bite is necessary in order to select proper treatment and to evaluate the prognosis of the condition. |
| **References:** |
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