

# *hypodontia*

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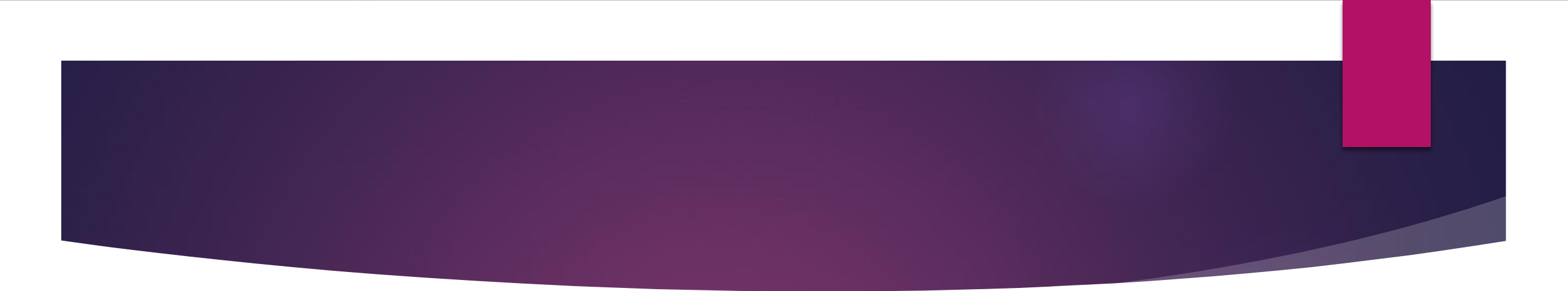
# hypodontia

- ▶ Hypodontia is the most prevalent dentofacial malformation in humans .It may occur as part of a recognized genetic syndrome or as a non syndromic isolated trait. The condition refers to the developmental failure of six or fewer teeth. various terms have been used to describe it. These terms include “congenitally missing teeth,” “toothagenesis,” “hypodontia,” “oligodontia,” and “anodontia.

Oligodontia and anodontia are used to describe more severe forms of tooth agenesis, typically the absence of more than six teeth and the entire dentition

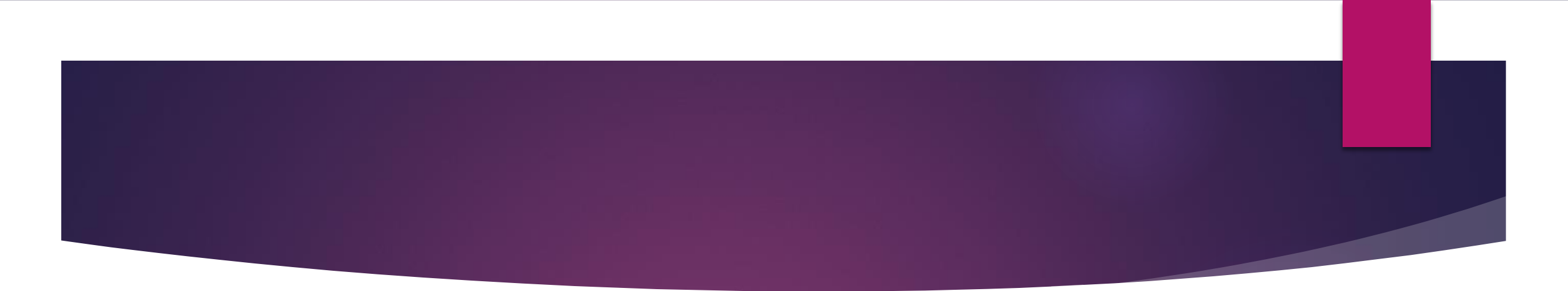
# Prevalence

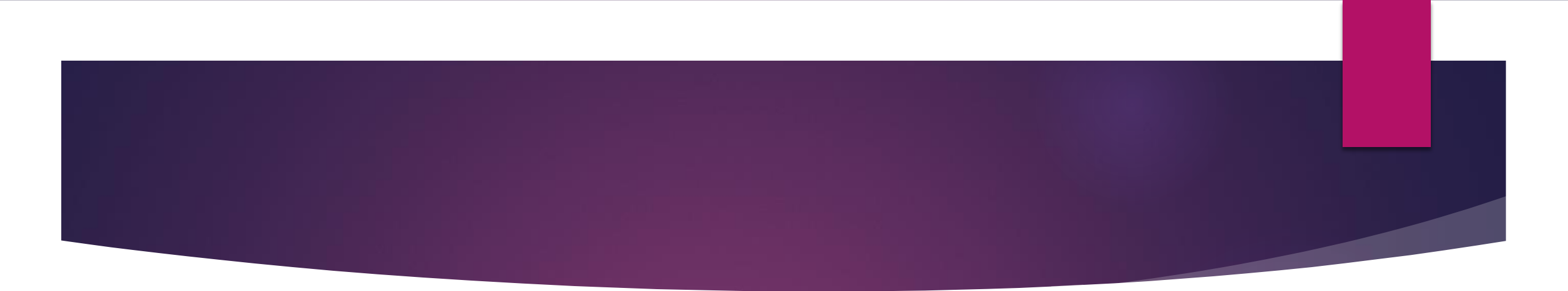
- ▶ Deciduous Dentition: Tooth agenesis is considered rare in the deciduous dentition and is not as common as in the permanent dentition. An association exists between hypodontia in the primary and permanent dentitions, with reports of children with primary teeth hypodontia showing absence of the corresponding successor teeth
- ▶ The deciduous maxillary lateral and mandibular central incisors account for 50% to 90% of affected deciduous teeth. Most cases present as unilateral hypodontia, with mostly one or two teeth missing. No significant sex difference in prevalence has been reported from any of the populations studied

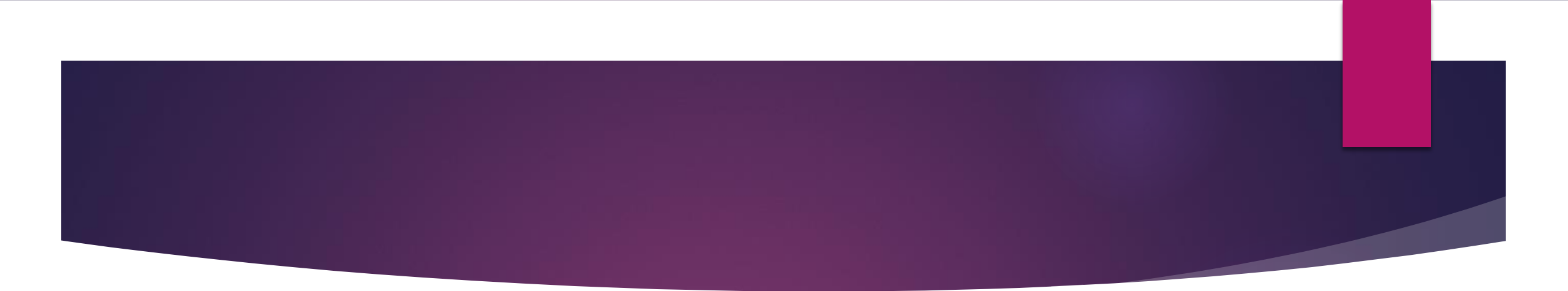
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- ▶ Permanent Dentition: The prevalence of hypodontia, which may be increasing with time, ranges from 1.6% to 36.5%. At least 1 in 5 individuals lacks a third molar, while most individuals with hypodontia (80%) lack only one or two teeth. Most individuals were missing only one or two permanent teeth, with very few missing more than six. Mandibular second premolars and the maxillary lateral incisors were reported to be the most likely to be missing.
  - ▶ Tooth agenesis does not seem to affect the maxilla and the mandible differently, although there was one early study that found the mandible to be more frequently affected than the maxilla.
  - ▶ bilateral agenesis of maxillary lateral incisors occurred more often than unilateral agenesis. For the other teeth, such as the second mandibular premolar, unilateral agenesis was more common.

# Features Associated with Hypodontia

- ▶ Tooth agenesis is often nonsyndromic, but it can also be associated with oral clefts and several other syndromes.
- ▶ The prevalence of hypodontia is higher in more severe clefting cases, most likely presenting with the agenesis of a maxillary lateral incisor.
- ▶ Other conditions that have hypodontia as one of their features include Down's Syndrome and ectodermal dysplasia. In these syndromes, there is a characteristic pattern of agenesis that is usually different from the overall population.

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- ▶ **Dental Features:** Microdontia is a widely reported feature of hypodontia. This condition, which can affect one or more teeth. In addition, microdontia is genetic and presents in its severest form as ectodermal dysplasia. It is also present in patients who have had chemotherapy or radiation of the jaws earlier in childhood. Brook proposed that microdontia and hypodontia are linked genetically, where a tooth will fail to develop if the tooth germ does not reach a particular tooth size and tooth number.
  - ▶ Delays in tooth development are another common feature, whereby the absence of a permanent successor delays the normal resorption of the roots of the primary teeth. The deciduous teeth may be retained for up to 40 or 50 years. Meanwhile, approximately 46% of individuals with tooth agenesis also have short roots of other permanent teeth.

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- ▶ Another common feature of hypodontia is the ectopic positioning of the permanent teeth. This is likely caused by the absence of neighbouring teeth available to guide them during eruption .
  - ▶ Transposition of teeth is also seen more commonly in individuals with hypodontia. Tooth agenesis is also associated with enamel hypoplasia, peg maxillary lateral incisors, primary molar infraocclusion, and palatally inclined or impacted maxillary canines.
  - ▶ Intraorally, retroclined and overerupted lower incisors contribute to a greater overbite. Generalised spacing and rotations of teeth adjacent to missing mandibular second premolars are also commonly seen .

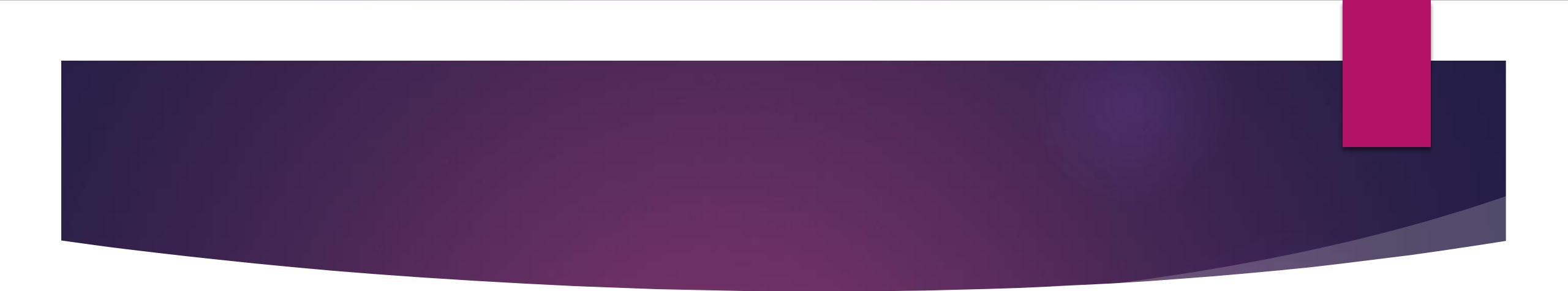
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- ▶ **Skeletal Features:** Hypodontia patients tend to present with lower mandibular plane angles, associated with a smaller lower anterior face height and lip protrusion.
  - ▶ Other features include smaller maxillary and mandibular lengths and a Class III skeletal relationship tendency. The short face height, along with the large freeway space, which is typical of hypodontia patients, may make them appear overclosed .

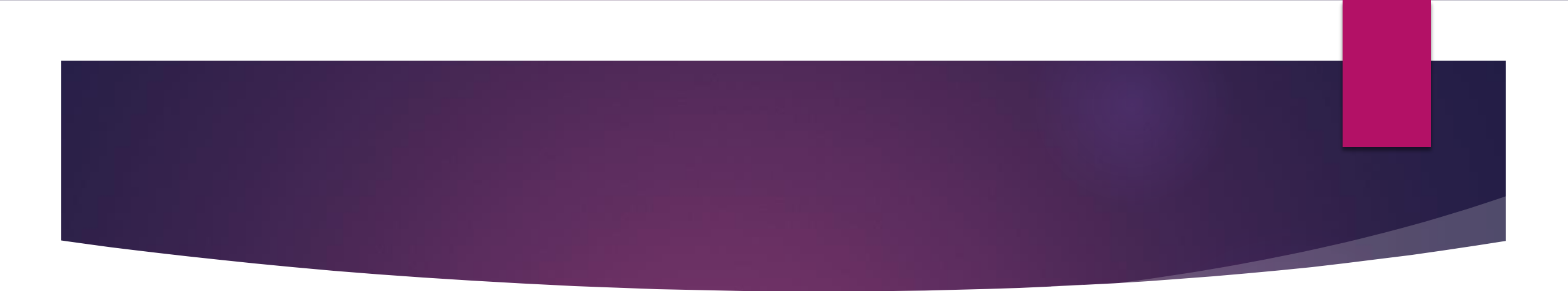
# Aetiology

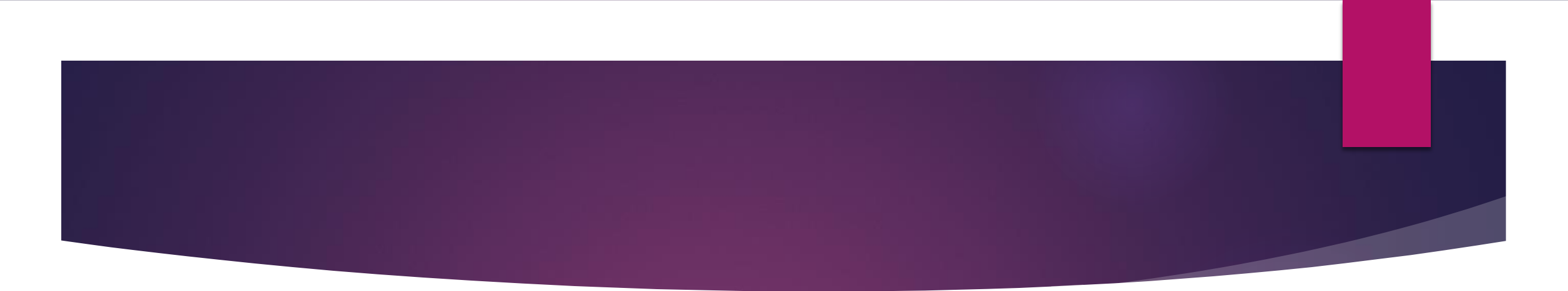
- ▶ the aetiology of hypodontiaa multifactorial involves genetic regulation and environmental factors. both genetic and environmental, that have been connected with this condition.
- ▶ **Tooth Development:**A series of genetically controlled successive molecular interactions are involved in the development of teeth .Numerous factors, such as those from the fibroblast growth factor (Fgf), wingless related integration site (Wnt), and bone morphogenic protein (Bmp)take part in the signalling of epithelial-mesenchymal interactions in tooth development .Alterations in one or more of the signalling pathways may affect dental development and may play a role in causing a condition such as hypodontia.

# Tooth Agenesis Theories

- ▶ Tooth Agenesis Theories. Several theories exist to decipher the cause of hypodontia, and most have focused on either genetic or environmental factors, although the importance of both components in the agenesis of teeth is now well recognized. These theories can be considered as either
- ▶ evolutionary or anatomical.
- ▶ the evolutionary viewpoint, which attributed tooth agenesis to shortening of the intermaxillary complex and the reduction in tooth number due to shorter arches.

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- ▶ anatomical principle, based on the hypothesis that specific areas of the dental lamina are prone to environmental effects throughout tooth maturation.
  - ▶ Related to the agenesis of the maxillary lateral incisors, the mandibular second premolars, and central incisors to the fact that they develop in areas of initial fusion of the jaw .
  - ▶ For example, maxillary lateral incisors develop in the region where the lateral maxillae and medial nasal bone processes fuse, while the mandibular second premolars originate in another delicate region.

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- ▶ Genetic Factors. Most craniofacial traits result from a complex interactions between genetic and environmental factors. Heritability can be expressed as a ratio that estimates the extent to which genetic characteristics affect the variation of a trait in a specific population at a point in time.
  - ▶ agenesis of lateral incisors and premolars is inherited via an autosomal dominant gene, with incomplete penetrance and variable expressivity. however, on whether hypodontia is a result of a polygenetic or single gene defect .

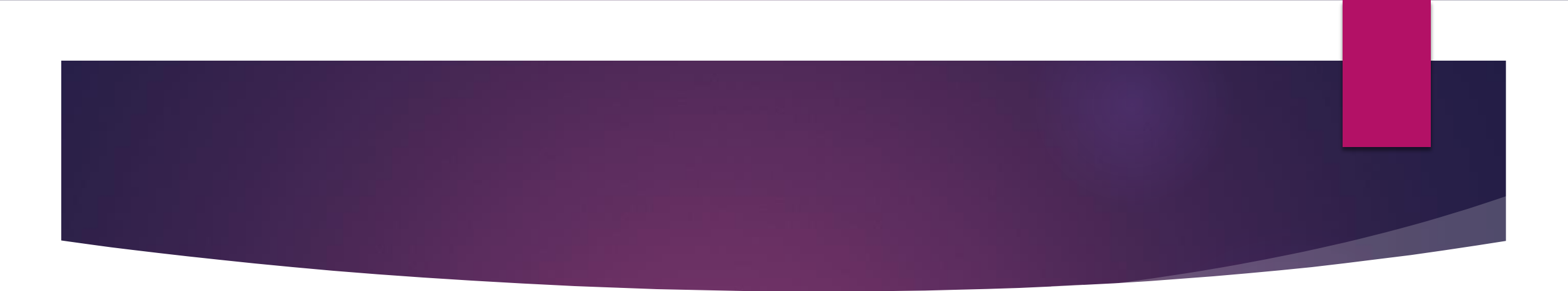
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- ▶ Environmental Factors. Craniofacial bones, cartilage, nerves, and connective tissue all originate from neural crest cells. Specific developmental cascades are therefore common to the morphogenesis of both teeth and some craniofacial structures. Indeed, several syndromes involving hypodontia often exhibit various dysplasias and clefts.
  - ▶ Environmental factors have long been known to be associated with a higher risk of some of these craniofacial anomalies. Factors such as trauma, infection, and toxins have been implicated

# Psychosocial and Functional Impact

- ▶ patients with hypodontia, the most common patient complaints included spacing between the teeth, poor aesthetics, and awareness of missing teeth. the patient is likely to have a negative impact on the social and educational development of these patients.
- ▶ Functionally, individuals with hypodontia tend to have deeper bites and spaces. Missing posterior teeth may not only result in further deepening of the bite, but the condition may also lead to nonworking interferences, poor gingival contours, and overeruption of the opposing teeth.

# Management of Hypodontia

The restoration of spacing that results from the agenesis of missing teeth is frequently complicated by the remaining present teeth, which are in unfavourable positions. Nevertheless, orthodontic treatment can facilitate any restorative treatment that may be required. Common issues faced in treating hypodontia patients include space management, uprighting and aligning teeth, management of the deep overbite, and retention. Space issues within the dental arch are multifactorial in origin. The amount of spacing is influenced by the presence of microdontia, retention of the primary teeth, and the abnormal eruptive paths and drifting of the successional teeth.

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- ▶ The decision on whether the treatment plan involves space closure or opening of the spaces of the missing mandibular second premolar depends on factors such as age of the patient; degree of inherent crowding; state of the deciduous teeth; type of malocclusion; and the circumstances of the patient (finances, attitude toward treatment, etc.).
  - ▶ In hypodontia patients, dental development is often delayed, as is orthodontic treatment. In young patients with mild crowding, extractions of specific primary teeth in the early mixed dentition may be useful to permit some favourable movement of adjacent teeth.



▶ THANK YOU