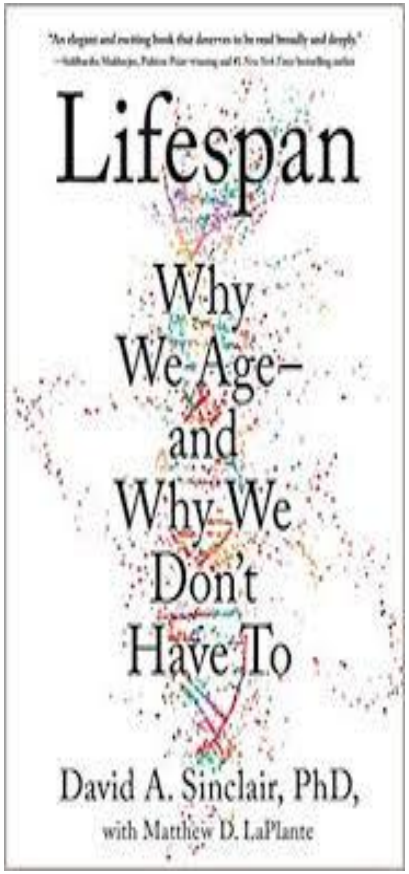

GOOD
Morning

vydehi
Institute of Dental Sciences
& Research Centre

ETIOLOGY OF MALOCCLUSION



Dr K Vidya Dhari
Senior lecturer
Dept of Orthodontics
VIDS&RC
Bangalore

LEARNING OBJECTIVES

At the end of this session students should understand

- Importance of etiology of malocclusion
- Various general etiological factors of malocclusion
- Various environmental factors associated with malocclusion
- Various local etiological factors of malocclusion

Introduction

- Fundamental to understanding malocclusion is the concept of `NORMAL OCCLUSION`.

- John hunter was the first to describe about normal occlusion

Introduction

MALOCCLUSION

"An occlusion in which there is mal-relationship between the arches in any of the planes of space or in which there are anomalies in tooth position beyond the limits of normal"

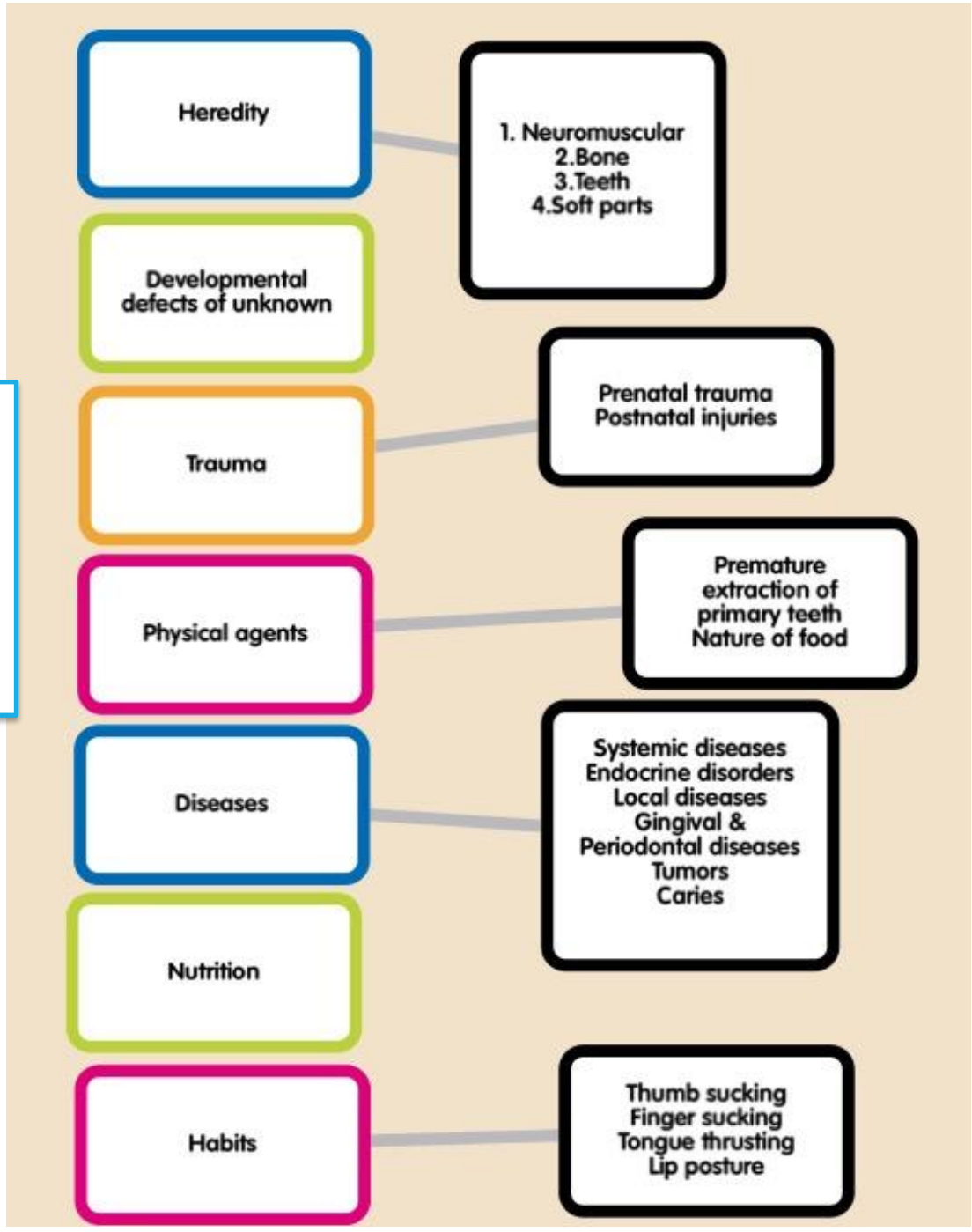
Introduction

- Etiology of malocclusion is the study of its causes.
- Recognition and elimination of the etiological factors is important so that one can prevent and correct the malocclusion and obtain a permanent result.
- Traditionally, any deviation from "ideal occlusion" has represented what Guilford termed mal-occlusion. Of course, ideal occlusion rarely exists in nature and so perhaps it is better to call this concept the "imaginary ideal"

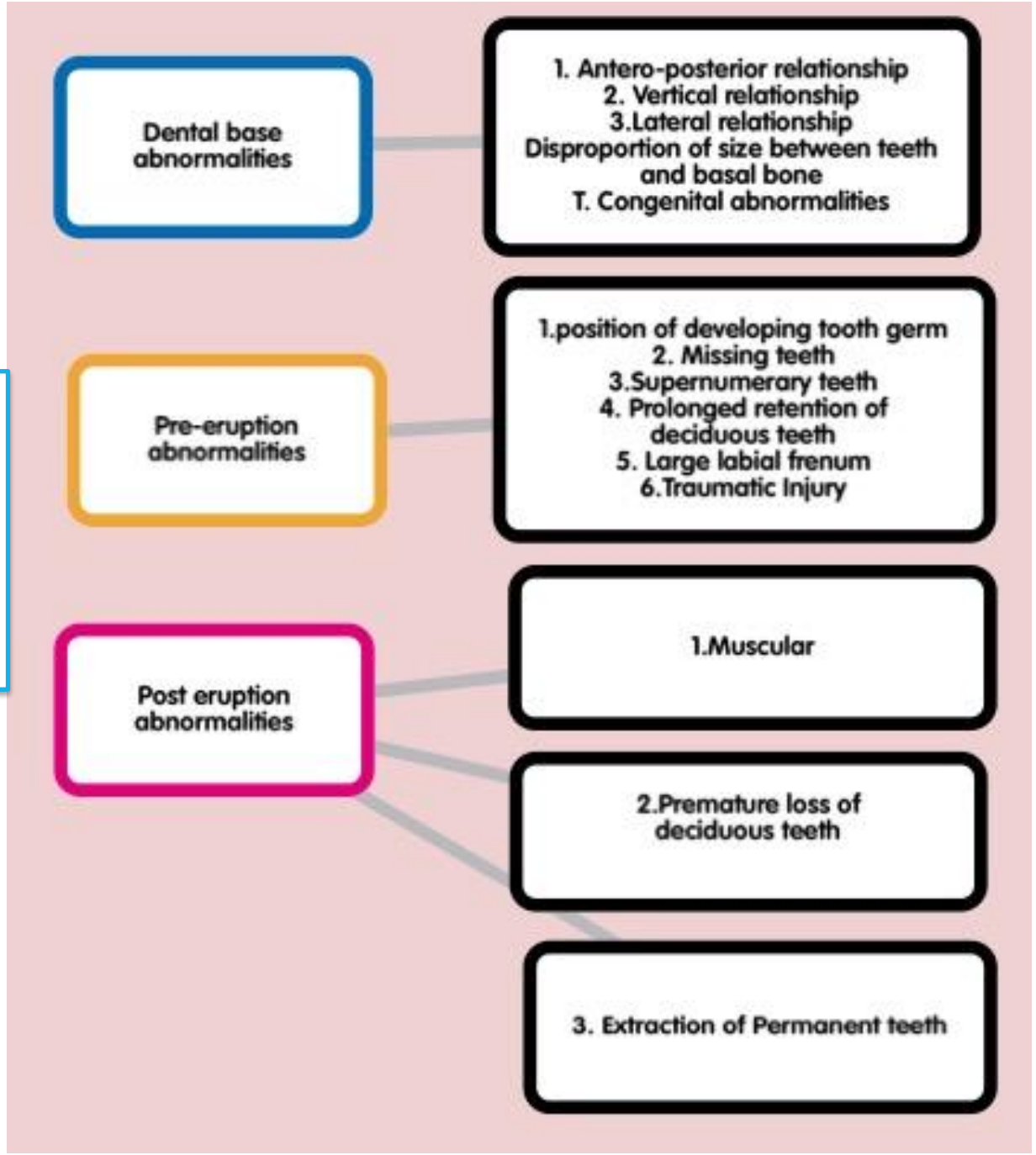
CLASSIFICATION

1. Moyer's classification
2. White and Gardiner's classification
3. Graber's classification

MOYERS CLASSIFICATION



WHITE & GARDENER'S CLASSIFICATION



GRABER'S CLASSIFICATION

GENERAL FACTORS

1. Heredity

Offspring's inherit quite a lot of resemblance. Heredity has long been attributed as one of the causes of malocclusion.

2. Congenital defects

General Congenital abnormalities

a. Abnormal state of mother during pregnancy

b. Malnutrition

c. Endocrinopathies

d.Infectious diseases

e. Metabolic and nutritional disturbances

f.Accidents during childbirth and pregnancy

g.Intrauterine pressure

h.Accidental traumatisation of the foetus by external forces

Local congenital factors

a. Abnormalities of jaw development due to intra uterine position

b. Clefts of the face and palate

c. Macro and microglossia

d.Cleidocranial dysplasia

Cleft lip and Palate
Cleidocranial dysplasia
Cerebral palsy
Congenital syphilis
Maternal Rubella infections

3.Environment

Prenatal factors
Postnatal factors

Abnormal foetus position - asymmetry

Maternal fibroids

Amniotic lesions

German measles

Thalidomide drugs

4.Pre disposing metabolic climate and disease

- endocrine imbalance
- metabolic disturbances
- infectious diseases

5.Dietary problems

- nutritional deficiency

6.Abnormal pressure habits and functional aberrations

7. Posture

8. Trauma and accidents

NUTRITIONAL DEFICIENCY

- Disturbances such as rickets, scurvy and berry-berry can produce severe malocclusions.
- Main problem is upsetting of the dental developmental time tables. The resultant premature loss, prolonged retention, poor tissue health and abnormal eruptive paths lead to malocclusion

ABNORMAL PRESSURE HABITS AND FUNCTIONAL ABERRATIONS

Non nutritive sucking habits, Includes all

sucking habits

- Thumb sucking
- Finger sucking
- Pacifiers

etc.

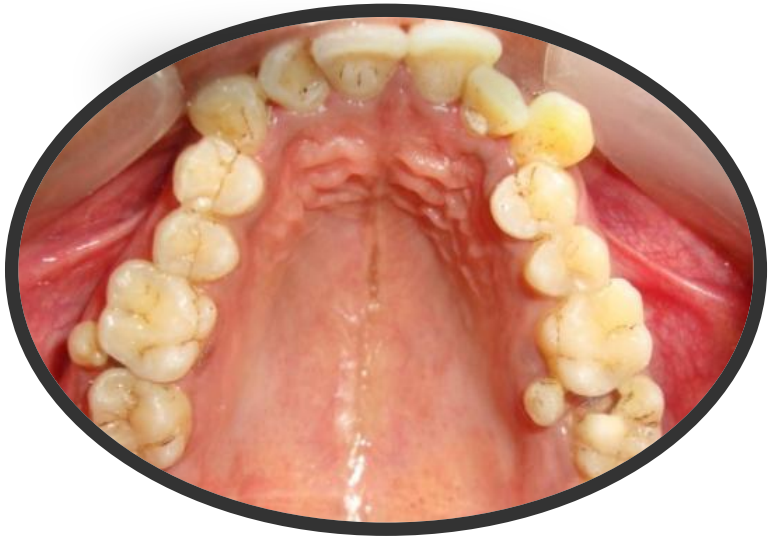
LOCAL FACTORS

1. Anomalies of number
   a. Supernumerary teeth
   b. Missing teeth
2. Anomalies of tooth size
3. Anomalies of tooth shape
4. Abnormal labial frenum
5. Premature loss
6. Prolonged retention of deciduous teeth
7. Delayed eruption of permanent teeth
8. Abnormal eruptive path
9. Ankylosis
10. Dental caries
11. Improper dental restorations

1. ANOMALIES OF NUMBER

- Supernumerary
- Missing teeth

SUPERNUMERARY TEETH



- Teeth that are **extra** to the normal complement are termed supernumerary teeth. These teeth have **abnormal morphology** and do not resemble normal teeth.
- Extra teeth that are normal are called supplemental teeth.

Supernumerary teeth can cause:

1. Non-eruption of adjacent teeth
2. Delay the eruption of adjacent teeth
3. Deflect the erupting teeth into abnormal locations
4. Crowding in the dental arches.

MISSING TEETH

Congenital absence

- Due to accidents / caries

Order of frequency

Max and mandibular 3rd molars

Max laterals

Mandibular 2rd premolars

Mandibular incisors

Maxillary second premolars

- Anodontia–complete absence
- Oligodontia–congenital absence of many, but not all teeth
- Hypodontia – absence of only a few teeth

Congenitally missing teeth can cause:

- Spacing in the dental arches
- Aberrant swallowing patterns
- Abnormal tilting / axial inclination or location of teeth
- Absence of permanent teeth may result in over-retained decidu teeth.

2.ANAMOLIES OF TOOTH SIZE

- Microdontia
- Macrodontia

3.ANOMALIES OF TOOTH SHAPE

Anomalies of shape occur as a result of developmental defects like amelogenesis imperfecta, hypoplasia, gemination, dens in dente, odontomas, fusions, congenital syphilitic abberations such as hutchinson's incisors and mulberry molars.

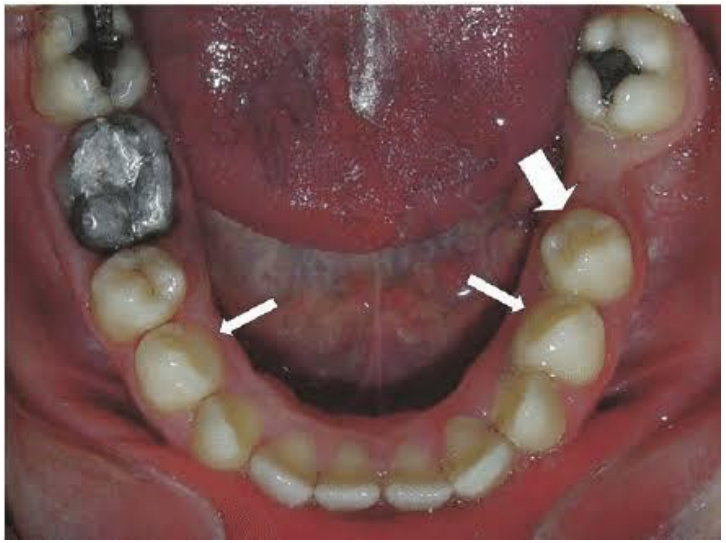
1. “Peg Lateral” - Most frequent – Leads to excessive spacing.

2. Abnormally **large cingulum** on maxillary incisors -

Prevent establishment of normal overbite and overjet. The involved tooth is usually in labioversion due to the forces of occlusion.

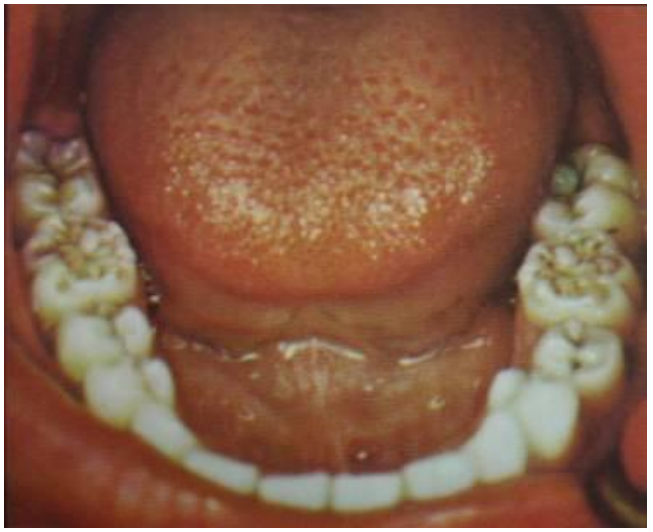
3. Additional lingual cusp of mandibular 2nd premolars-

Increase the mesiodistal dimension of tooth



4.Congenital syphilis –

It is often associated with hypoplasia of maxillary and mandibular anteriors. Characteristics of congenital syphilis are “Hutchinson’s incisors” and “mulberry molars”.

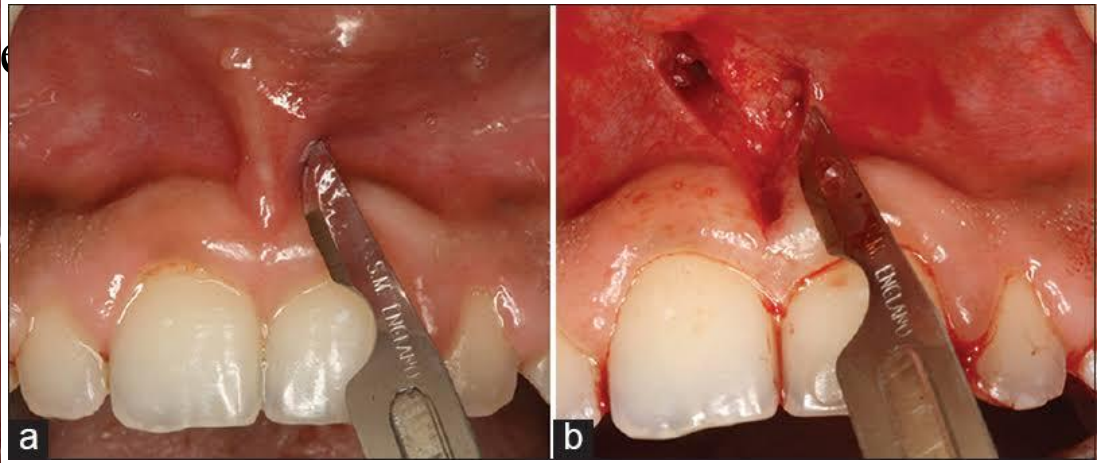


5.Dilaceration –

Characterized by an abnormal angulation between the crown and root of a tooth, or angulation within the root. Usually occurs due to trauma during the period in which the tooth is forming with the result that the position of the calcified portion of the tooth is changed and the remainder of the tooth is formed at an angle.

4.ABNORMAL LABIAL FRENUM

If the frenum is thick, it prevents the closure of diastema (which is normal during mixed dentition prior to the eruption of canines)



Some of the other causes of midline diastema:

- Ugly duckling stage
- Microdontia
- Macrognathia
- Congenitally missing lateral incisors
- Supernumerary tooth in the midline
- Peg laterals
- Abnormal pressure habits eg. Digit sucking, tongue thrusting, lip biting or sucking
- Midline cysts
- Heredity

5.PREMATURE LOSS OF DECIDUOUS TEETH

Loss of a deciduous 2nd molar will lead to mesial drift of the 1st permanent molar and blocking of erupting 2nd premolars

6. PROLONGED RETENTION AND ABNORMAL RESORPTION OF DECIDUOUS TEETH

If the roots of the deciduous teeth are not resorbed properly, uniformly or on schedule, the permanent successors may be either withheld from eruption, or they may be deflected into malposition

7. DELAYED ERUPTION OF PERMANENT TEETH

- Endocrine disorders like hypothyroidism
- Presence of supernumerary teeth or deciduous root
- Mucosal or Bony barrier

8.ABNORMAL ERUPTIVE PATH

This is usually a secondary manifestation of a primary disturbance

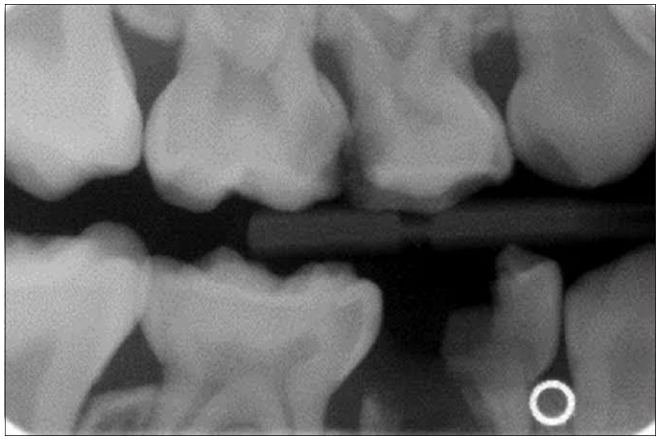
- Severe crowding
- Super numerary tooth
- Retained deciduous tooth / root fragment
- Bony barrier
- Dentigerous cysts

9.ANKYLOSIS

- Ankylosis or partial ankylosis occurs relatively frequently during 6-12 year age period.
- Ankylosed deciduous teeth should be identified and treated by removal or building up or surgical subluxation along with space maintainers.
- Permanent teeth can also be found to be ankylosed can be due to
- Accidents / trauma
- Congenital diseases like cleidocranial dysostosis

10.DENTAL CARIES

- Dental caries should be considered as one of the local factors causing malocclusion.
- Caries which leads to premature loss of a deciduous or permanent tooth may cause drifting, axial inclination, over eruption, bone loss etc.



11. IMPROPER DENTAL RESTORATIONS

- Large proximal restorations change gradually under the assault of occlusal forces, and arch length is increased. This may result in the creation of broken contacts, rotations, crossbite conditions and functional prematurities. Lack of anatomic detail in restoration of cuspal areas of a tooth can permit elongation of opposing tooth.
- Loose contacts also leads to food packing, teeth tend to move apart and also leads to bone loss

CONCLUSION

- Knowledge about the various etiological factors of malocclusion will help us to plan the various interceptive and preventive orthodontic procedures.
- It also helps in eliminating the etiological factor if it is of a environmental type.
- A sound knowledge about the various factors that lead to malocclusion, will definitely help is to render excellent treatment for our patients with good retention and stability.

ACTIVITY DESK

Match the following

1. **Tooth shape anamoly**
2. **Congenital syphilis**
3. **Abnormal cingulum**
4. **Microdonita**

a. Labio-version
b. Spacing
c. Peg laterals
d. Hutchinson Incisors

FIND THE ETIOLOGIES

- **Abnormal eruptive path**
- **Spacing**
- **Skeletal Malocclusions**

At the end of this session you are able to

- Define malocclusion
- Understand importance of etiology of malocclusion
- Various general etiological factors of malocclusion
- Various environmental factors associated with malocclusion
- Various local etiological factors for malocclusion


THANK YOU