Diagnostic Procedures

Karl Grimes

Consultant Orthodontist

Learning outcomes

- Understand the clinical assessment and diagnosis of malocclusion
- Understand how to undertake a clinical and radiographic assessment
- Explain how study model analysis and clinical photography impact treatment planning
- Explain how clinical records are pertinent to the making of a diagnosis

Patient’s complaint and motivation

- Main concerns and expectations
- Increased demand and awareness among patients
- May be driven by parent or dentist

Medical history

- Impact on provision of orthodontic treatment
- Cardiac/bleeding disorders
- Diabetes
- Epilepsy
- Medications
- Allergies

Dental history

- Regular attendance with GDP
- Previous restorations/extractions
- Previous orthodontic treatment

Extraoral examination

- Frontal view
- Natural head posture

Vertical relationship

- Split into thirds
- Lower face height
- Upper lip (1/3)
- Lower lip (2/3)

Lip relationship

- Competent lips
- Potentially competent
- Incompetent

Incisor show at rest

- 3-4mm show at rest
- F>M
- Reduces with age
- Lip length
- Male 22m
- Female 20mm

Incisor show on smiling

- 75-100% incisor show on smile

- Excessive ‘gummy smile’ unattractive

Transverse and symmetry

- Face divided into fifths
- No face truly symmetrical
- ‘Birds eye’ and ‘worms eye’

Mandibular asymmetry

- Hemimandibular hyperplasia
- Hemimandibular elongation
- Maxillary cant

Profile view

- Anterposterior relationship
- Zero meridian
- Kettles method

Nasolabial angle and lip protrusion

- Angle formed between upper lip and base of nose (columella)
- 90-110 degrees

Vertical relationship

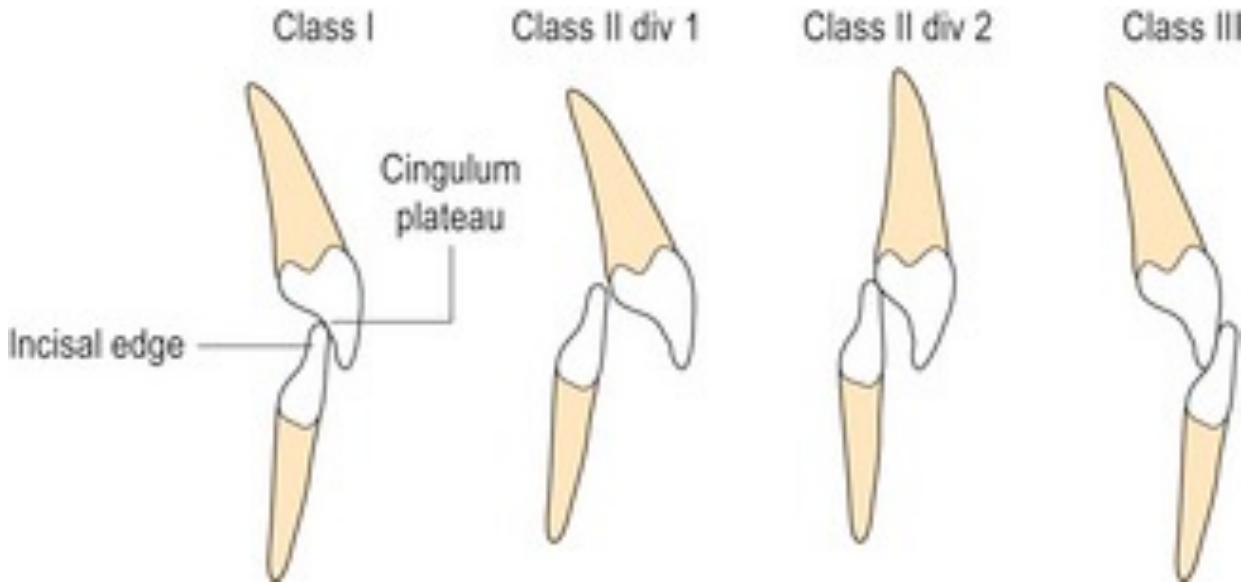
- Divided into thirds

Intraoral examination

- Dental health
- Presence of teeth
- Caries, restorations, OH
- Trauma
- Erosion/attrition

Dental arches

- Crowding
- Rotations
- Displacements
- Inclinations
- Permanent canines



INCISOR CLASSIFICATION

British Standards Institute

Class II malocclusion

- 25% in UK

- Aetiology:
- Skeletal
- Soft tissue
- Digit habit

Class III malocclusion

- 1-4% in Europe
- E/O assessment
- I/O assessment

Overjet

- Labial surface of the most prominent maxillary incisor to the labial surface of mandibular incisor
- 2-4mm
- Class III given negative value

Overbite

- 2-4mm or 1/3-1/2 crown height
- Increased
- Decreased
- Complete
- Incomplete

Anterior crossbite

- Records teeth in crossbite
- Presence and size of displacement between RCP and ICP
- Gingival recession

Anterior crossbite with displacement

Centrelines

- Assessed in relation to facial midline and each other

- Causes:
- Asymmetric dental crowding
- Buccal crossbite with displacement
- Skeletal asymmetry

Buccal segments

- Angles classification
- Class I
- Class II
- Class III

Posterior crossbite

- Buccal crossbite
- Lingual crossbite (Scissor bite)
- Unilateral
- Bilateral

Mandibular lingual crossbite

Temporomandibular joint

- Clicking
- Crepitus
- Locking
- Pain

TMD

ADVICE SHEET BRITISH ORTHODONTIC SOCIE

TEMPOROMANDIBULAR DISORDERS (TMDS) AND THE ORTHODONTIC PATIENT

is advice sheet gives advice for orthodontists who have patients with mporomandibular disorders (TMD).

oduction

mportance of occlusion in the aetiology of TMD (Temporomandibular Disorders) ence the role of the orthodontist in the management of these disorders has caused versy for a number of decades. This is possibly due to some studies finding weak tions between some types of malocclusion and TMD.

t is generally accepted that TMD is not just one condition but rather several which ncompasses a variety of signs and symptoms. Many other terms have been mployed including: temporomandibular pain dysfunction syndrome (TMPDS), asticatory myalgia and craniomandibular dysfunction. Recent research shows that ctors such as depressive illness, sleep disturbances and stress are amongst the ajor aetiological factors in TMD, rather than occlusal factors. Genetic factors may so predispose to causing some TMDs.

vidence is being established to indicate that not only can TMJ pain be influenced hormone level changes but there may also be sex differences in hormone ceptor levels in the TMJ discs. Furthermore, genetic variation in human stress sponse and resiliency is now also being found.

MD is common and can be found in individuals from all over the world. Prevalence aries between studies from 7 to 84% with an age range from 3 to 74 years. It is enerally accepted that TMD is more common in females than males and tends to tart in teens, increasing in prevalence with age. It is, therefore, not surprising that ve occasionally see patients with TMD as the demographics match those of our orthodontic patients.

ssment of TMD

good practice to routinely undertake a TM joint assessment as part of the patient's odontic assessment.

Any pre-existing TMD signs or symptoms should be clearly recorded in the notes. For example: pain on palpation of temporomandibular joints, pain on palpation of associated muscles, limitation or deviation of mandibular movement and joint sounds.

- However, even if the patient has no signs or symptoms of TMD, this fact should still be recorded.

- It is important to inform the patient if they have TMD signs and/or symptoms before orthodontic treatment commences so that the patient does not think they have occurred as a result of orthodontic treatment. It is also helpful to explain that orthodontic treatment is not being undertaken to cure their TMD. Even if a patient has not indicated that they expect improvement of their TMD, they may nevertheless expect this from what they have been informed previously.

Advice to patients with TMD prior to treatment

- Orthodontists can offer simple conservative advice to patients who are planning to undergo orthodontic treatment.
- There is a patient information leaflet available to download from www.bos.org.uk
- For those with clicking or locking it is often beneficial to give a brief explanation about the disc and how it does not always move in harmony with the condyle. Patients can be reassured that their symptoms are not necessarily progressive and will often resolve spontaneously.
  An explanation of the relationship with stress (e.g. can get worse around exam time) is also useful.
  Advice on some practical measures can include:
  (i) Resting the joint - e.g. avoiding over opening during wide yawning etc.
  (ii) Soft diet – some patients find certain food will trigger symptoms
  (iii) Analgesics – e.g. non steroidal anti-inflammatory drugs (if not otherwise contra-indicated)
  iv) Application of heat - *e.g.* a heat pack can be used to relax muscles.

conservative measures are ineffective, then the orthodontist can consider referral a clinician with an interest in TMD, although the availability of such help varies om area to area.
is good practice to delay the start of appliance treatment until acute symptoms ave settled.
nterestingly, some patients report relief from symptoms during treatment.

ement of TMD during orthodontic treatment

If a patient develops TMD during treatment, management is in the same conservative manner as described above.

ıld we treat to a functional occlusion to avoid future TMD?

ıs been suggested by some orthodontists that achieving certain occlusal goals will tect against future TMD.
ese goals can include:
a) A mutually-protected occlusion *i.e.* canine guidance/group function and anterior guidance.
b) Avoidance of non-working side interferences.

- If it is straightforward and reasonable to achieve these occlusal goals, then there is no obvious reason not to encourage this. However, there is lack of consensus as to what precise occlusal scheme constitutes a "functional occlusion" and it is not clear that such an occlusion would, in any case, be stable or increase stability. In

Orthodontic records

- Diagnosis
- Monitoring growth
- Medico-legal requirement

- Communication tool

- Research
- Clinical audit

Study models

- Impression showing:
- All erupted teeth
- Full depth of palate
- Good soft tissue extension

- Alginate impressions

- Poured in dental stone
- Trimmed with occlusal plane parallel to base

Kesling set up

- Aesthetic preview before commencing treatment
- Mange patient’s expectations
- Lad technician adds wax to articulated model
- Facilitates: design, occlusal scheme, restoration design and aesthetic outcomes

Clinical photographs

- Essential part of clinical record
- Baseline record of presenting malocclusion
- Treatment planning
- Monitoring treatment progression
- Teaching

Extra-oral photographs

- Full facial frontal
- Full facial frontal smiling
- Facial three-quarters
- Facial profile

Intra-oral photographs

- Frontal occlusion
- Buccal occlusion (left and right)
- Maxillary dentition
- Mandibular dentition

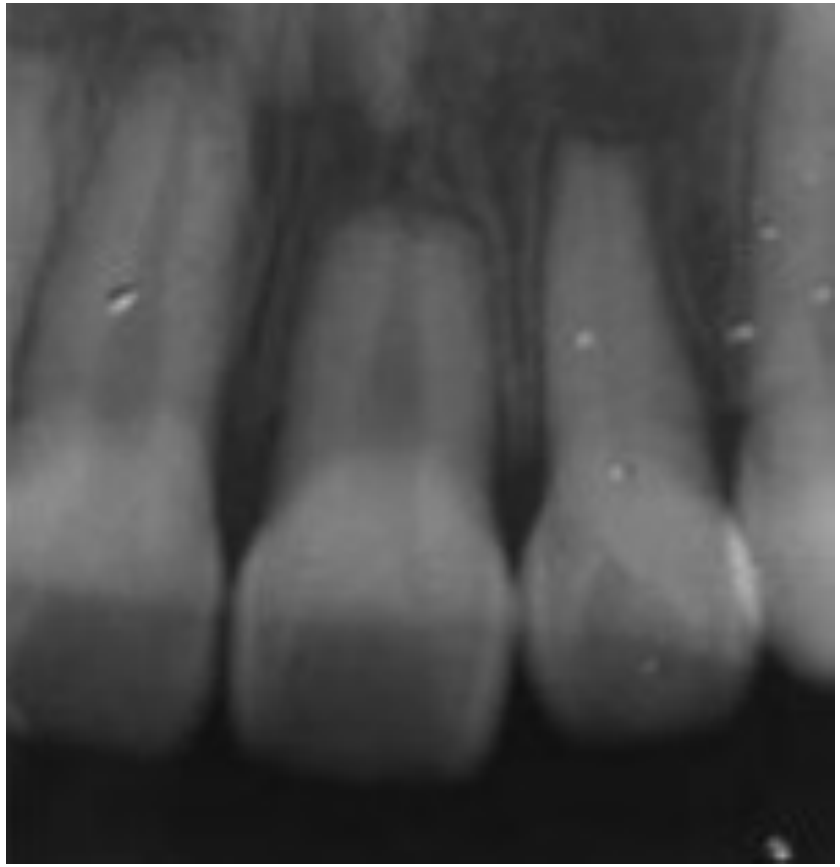
Radiographs

- Required prior to orthodontic treatment:
- Presence or absence of permanent teeth
- Root morphology
- Presence of dental disease
- Presence of supernumerary teeth
- Position of ectopic teeth
- Relationship of dentition to dental bases and relationship to cranial base.

Presence or absence of permanent teeth

Presence or absence of permanent teeth

Root morphology



Root morphology

Presence of dental disease

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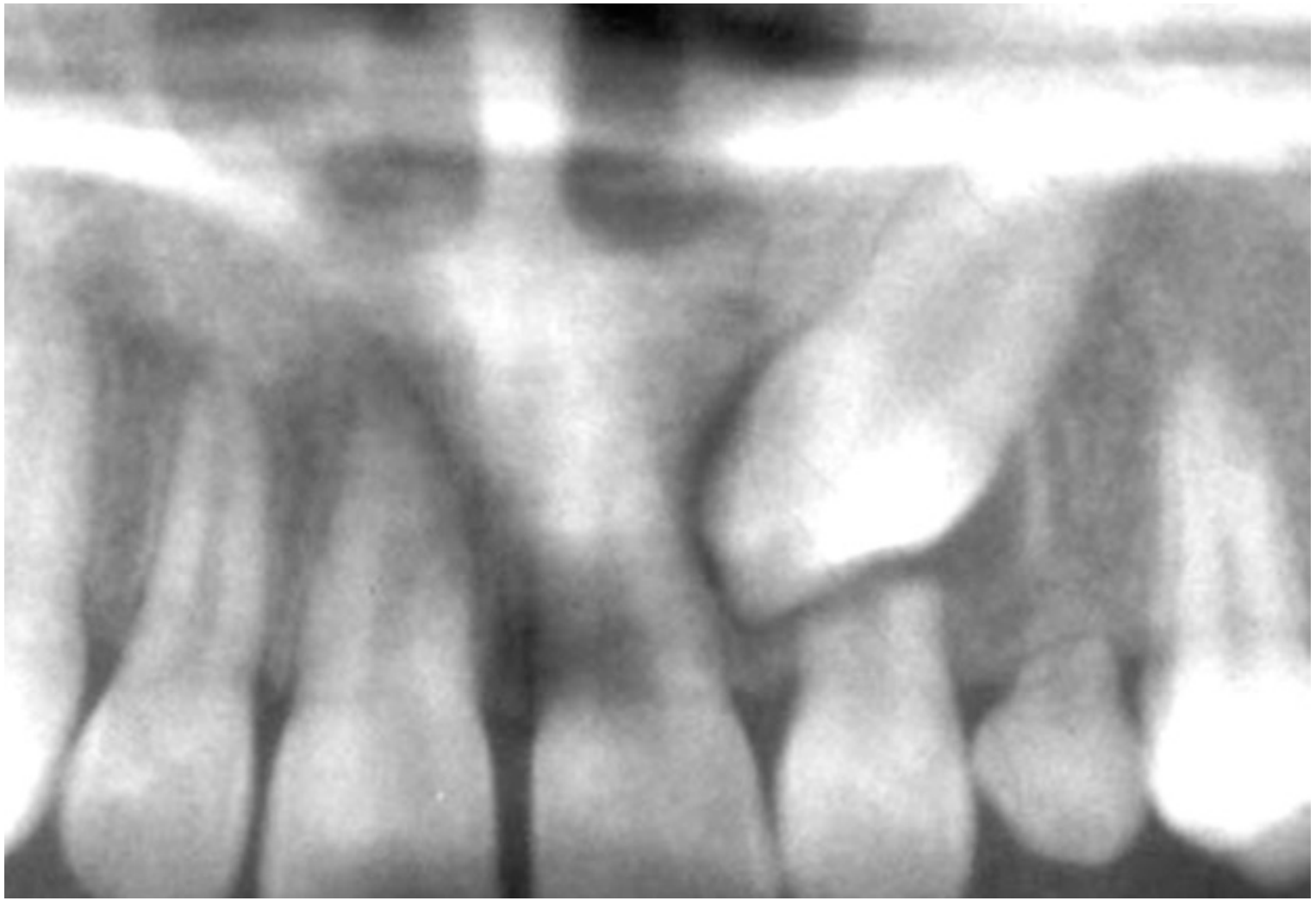
Presence of supernumerary teeth

Presence of supernumerary teeth

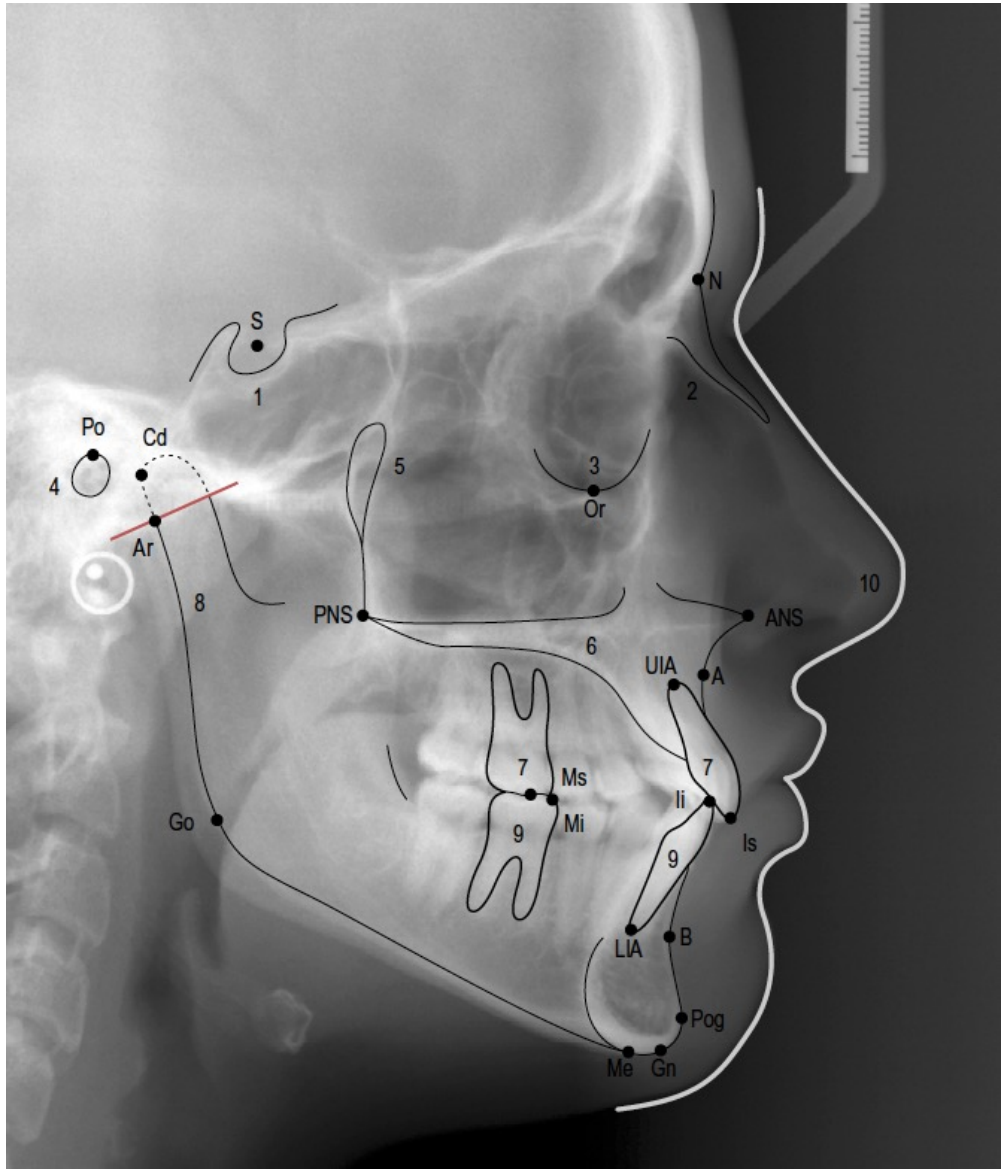
Position of ectopic teeth

Position of ectopic teeth



Relationship of dentition to dental bases and relationship to cranial base.

Cephalometric tracing



Three-dimensional imaging

- Plain film are invaluable for diagnosis
- Only provide a 2D image of a 3D structure
- Computed tomography (CT)
- Cone Beam Computed Tomography (CBCT)

Questions