FDI CSA

世界牙科联盟 中华口腔医学会

# 临床牙科进展报告会

Continuing Dental Education Programme

UPDATE IN CLINICAL DENTISTRY

**25-27 October, 2004**

**Hangzhou China**

# Programme

# 报告会日程

## 2004年10月26日（星期二）

地址:

| | | |
|---|---|---|
| 8:30 ~ 9:00 | Opening ceremony　开幕式 | |
| 9:00 ~ 10:20 | Color theory and Application in Dentistry<br>颜色的理论及在牙科中的应用 | Asbjorn Jokstad Norway |
| 10:20 ~ 10:40 | Break　休息 | |
| 10:40 ~ 12:00 | Tooth wear<br>牙齿磨损 | Asbjorn Jokstad Norway |
| 12:00 | Lunch　午餐 | |
| 1:30 ~ 2:50 | Chemotherapeutics in the management of Periodontal Diseases<br>牙周疾病治疗中的药物治疗 | P.Mark Bartold Australia |
| 2:50 ~ 3:10 | Break　休息 | |
| 3:10 ~ 4:30 | Relationship between Periodontal Health and Systemic Health<br>牙周健康与全身健康的关系 | P.Mark Bartold Australia |

## 2004年10月27日（星期三）

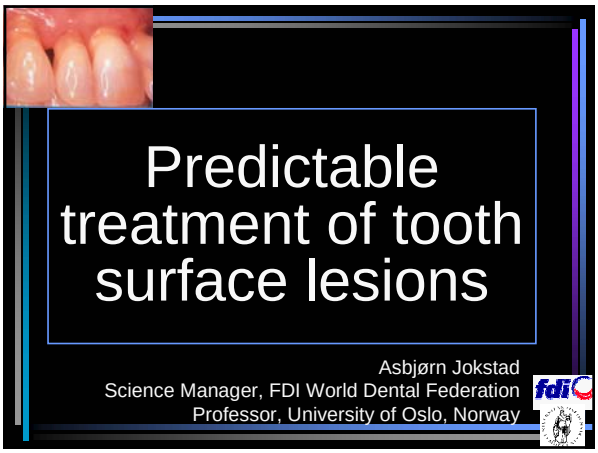
| | | |
|---|---|---|
| 8:30 ~ 11:30 | (9:50 ~ 10:10　Break　休息)<br>Current Trends in Aesthetic and Restorative Dentistry<br>美容修复口腔医学的目前发展趋势 | Juergen Manhart Germany |
| 12:00 | Lunch　午餐 | |
| 1:30 ~ 2:50 | How to Fabricate Complete Denture for Edentulous Patients with Low and Flat Alveolar Ridge<br>如何为牙槽嵴低平患者制作全口义齿 | TianWen Guo China |
| 2:50 ~ 3:10 | Break　休息 | |
| 3:10 ~ 4:30 | The Preliminary Research on the Basis and Clinical Apply of Reverse Neck Dissection<br>逆行性颈淋巴清扫术的基础和临床应用初步探讨 | ShiFang Zhao China |

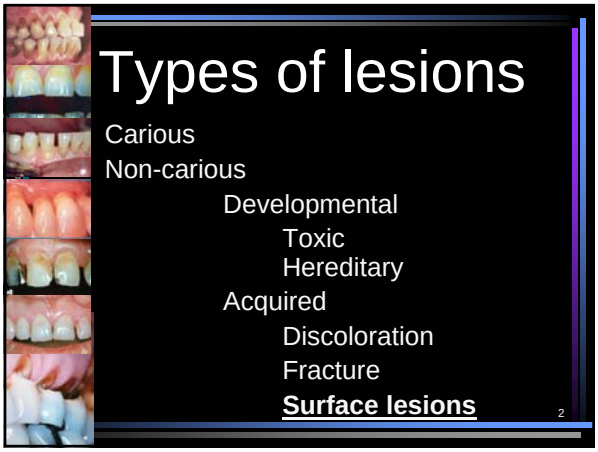
## 2004年10月25日（星期一）

## Orthodonic Course　口腔正畸专题

地址:

| | | |
|---|---|---|
| 8:30 ~ 12:30 | (10:30 ~ 10:50　Break　休息)<br>Contemorary Orthodontic Practice---Biomechanics and Smart Wires<br>现代正畸实践: 生物力学与SMART弓丝 | Ravindra Nanda USA |
| 12:30 | Lunch　午餐 | |
| 1:30 ~ 2:30 | Differential Diagnosis and Treatment of Class Ⅱ and ClassⅢ Malocclusions<br>Angle Ⅱ类和Ⅲ类错𬌗的鉴别诊断与治疗 | QiMin Teng Taipei |
| 2:30 ~ 3:30 | Orthodontic management of periodontal Patients with Periodontal disease<br>牙周病患者的正畸治疗 | YanHeng Zhou China |
| 3:30 ~ 4:30 | Adult orthodontic treatment--a great chance and challenge for orthodontist<br>成年人正畸治疗—机遇与挑战同在 | HaiPing Lu China |


Predictable treatment of tooth surface lesions
Asbjørn Jokstad
Science Manager, FDI World Dental Federation
Professor, University of Oslo, Norway


Types of lesions
Carious
Non-carious
Developmental
Toxic
Hereditary
Acquired
Discoloration
Fracture
Surface lesions
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Management?

## Tooth surface lesions

A non-carious (non-bacterial) destructive process affecting the tooth/teeth

Diagnoses are based on etiology, clinical severity, pathogenic activity and on localization

Emerging evidence of the importance of an adequate salivary flow by use of sugarless lozenges or chewing gum

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## Tooth surface lesions

Erosion (clinical diagnosis)

*Definition:* Progressive loss of hard dental tissue by chemical processes not involving bacterial action

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## Tooth surface lesions

~~Erosion~~ Corrosion!

"Progressive loss of hard dental tissue by chemical processes not involving bacterial action"

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## Erosion:

ASTM: American Society for Testing & Materials Committee on Standards:

*"The progressive loss of a material from a solid surface due to mechanical interaction between that surface and a fluid, a multicomponent fluid, impinging liquid or solid particles"*

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## Erosion:

~~Erosion~~ Corrosion:

grade 1

grade 2

grade 3

## Tooth surface lesions

Corrosion

Abrasion (clinical diagnosis)

"Loss by wear of dental tissue caused by friction of a foreign substance (e.g., toothbrush, dentifrice, a.o.)"

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## Tooth surface lesions

Corrosion
Abrasion

Attrition (clinical diagnosis)

"Loss by wear of surface of tooth or restoration caused by tooth to tooth contact during mastication or parafunction"

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## Tooth surface lesions

Corrosion
Abrasion
Attrition

Abfraction (clinical diagnosis)

"Loss of tooth surface at the cervical areas of teeth believed to be caused by tensile and compressive forces during tooth flexure"

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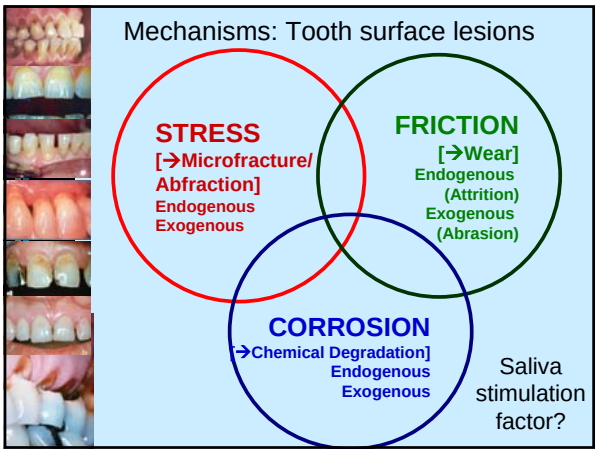


# Patient management

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## Patient management - Strategy 1

1. Establish status
2. Restore

   Carious & non-carious lesions

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## Patient management - Strategy 1

Symptomatic

1. Establish status
2. Restore
   carious & non-carious lesions

Diagnosis and etiology is of limited interest.

...perhaps only for the sake of guessing prognosis...

**DANGER:**
**Unpredictive treatment outcome!**

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## Patient management - Strategy 2

~~Symptomatic~~

~~1. Establish status~~

~~2. Restore~~
~~carious & non-carious lesions~~

~~Diagnosis and etiology is of limited interest. Perhaps only for the sake of estimating prognosis.~~

Causal

1. Diagnose correctly
   Carious vs non-carious
2. Identify etiology
   a. carious
   b. non-carious lesions
3. Restore
   Carious & non-carious lesions
4. Reduce risk
   a. carious
   b. non-carious lesions

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## 1. Diagnose correctly

1. Diagnostic Protocol
2. Types of lesions
   - Carious vs **non-carious lesions**

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Abrasion-attrition-corrosion?

Abfraction-abrasion-corrosion?

Abrasion-corrosion?


Abrasion-corrosion?


Abrasion-attrition-corrosion?


Abfraction-abrasion?

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Attrition-corrosion?

???!

”demastication”

## Diagnostic protocol for non-carious lesions 1/5. 1. **Obtain historical data (1/3)**

### Medical History

- Excessive vomiting, rumination
- Eating disorder
- Gastro-oesophageal reflux disease
- Symptoms of reflux
- Frequent use of antacids
- Alcoholism (possible narcotics?)
- Autoimmune disease (Sjögren's)
- Previous radiation treatment of head and neck
- Oral dryness, eye dryness
- Medications that cause salivary hypofunction
- Medications that are acidic

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## Diagnostic protocol for non-carious lesions 2/5. 1. **Obtain historical data (2/3)**

**Dental History**

- History of bruxism (grinding or clenching)
  -Grinding bruxism sounds during sleep noted by bed partner?
  -Morning masticatory muscle fatigue or pain?
- Former use of occlusal splint

**Dietary History**

- Acidic food and beverage frequency
- Method of beverage drinking (swish, swallow?)

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## Diagnostic protocol for non-carious lesions 3/5. 1. **Obtain historical data (3/3)**

**Oral Hygiene Methods**

- Toothbrushing method and frequency
- Type of dentifrice (abrasive?)
- Use of mouthrinses
- Use of topical fluorides

**Occupational/Recreational History**

- Regular swimmer?
- Wine-tasting?
- Working environment hazards?

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## Diagnostic protocol for non-carious lesions 4/5-**2. Physical assessment** (1/2)

**Head and Neck Examination**

- Tender muscles (bruxism?)
- Masseteric muscle hypertrophy (bruxism?)
- Enlarged parotid glands (autoimmune disease, anorexia, alcoholism)
- Facial signs of alcoholism:
  -Flushing, puffiness on face
  -Spider angiomas on skin

**General Survey**

- Underweight (anorexia)

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## Diagnostic protocol for non-carious lesions 4/5-2. Physical assessment (2/2)

**Intra-oral Examination**

- Signs of salivary hypofunction:
  -Mucosal inflammation / dryness
  -Unable to express saliva from gland ducts
- Shiny facets or wear on restorations (bruxism?)
- Location and degree of lesions (photos, models, radiographs)

**Salivary function assessment**

- Flow rate
- pH, buffer capacity (in research)

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## *Corrosion – clinical appearance*

*(anterior)*

- Broad concavities within smooth surface enamel
- Increased incisal translucency
- Wear on non-occluding surfaces
- Loss of surface characteristics of enamel (perikymata) in young children
- Preservation of enamel "cuff" in gingival crevice is common
- Hypersensitivity

## *Corrosion – clinical appearance*

*(posterior)*

- Cupping of occlusal surfaces, (incisal grooving) with dentin exposure
- Wear on non-occluding surfaces
- "Raised" amalgam restorations
- Clean, non-tarnished appearance of amalgams
- Preservation of enamel "cuff" in gingival crevice is common

## *Abrasion – clinical appearance*

- Usually located at cervical areas of teeth
- lesions  are more wide than deep
- Premolars and cuspids are commonly affected

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## *Attrition – clinical appearance*

- Matching wear on occluding surfaces
- Shiny facets on amalgam contacts
- Enamel and dentin wear at the same rate
- Possible fracture of cusps or restorations

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## Attrition vs corrosion

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## *Abfraction – clinical appearance*

- Affects buccal / labial cervical areas of teeth
- Deep, narrow V-shaped notch
- Commonly affects single teeth with excursive interferences or eccentric occlusal loads

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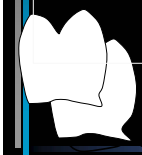
## Cervical loss

| Locations: | Ling./Bucc. | Buccal | Buccal |
|---|---|---|---|
| Form: | U | Wedge | V-form |
| Edge: | smooth | sharp | sharp (sometimes subgingival) |
| Enamel: | smooth often slightly polished | smooth/rough | rough |



Probably:

Abrasion ---------- ---------- Abfraction

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## Abfraction vs Abrasion

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1. Diagnose correctly
   1. Diagnostic Protocol
   2. Types of lesions
      - Carious vs **non-carious lesions**
2. Identify etiology (causes)
   - (a. carious) & **b. non-carious lesions**

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## Corrosion - Critical pH

- The pH at which any particular saliva ceases to be saturated with calcium and phosphate is referred to as the critical pH. Below this value, the inorganic material of the tooth may dissolve.
- Critical pH varies according to the calcium and phosphate concentration, but it is usually around 5.5.

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## Corrosion

Dietary acids is the principal causative factor
- Consumption of low pH drinks
- Prolonged, frequent consumption of acidic drinks

- Dietary analysis

*Intrinsic corrosion* is the result of endogenous acid. This is gastric acid contacting the teeth during recurrent vomiting, regurgitation or reflux.

- Bulimia nervosa (*self induced* vomiting)
- Causes of somatic origin include alcoholism, antabus therapy for alcoholism, gastrointestinal disorders.

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## Gastroesophageal reflux disease- signs & symptoms

| Common Symptoms in Adults | Common Symptoms in Children |
|---|---|
| •Acid taste in mouth<br>•Persistent coughing<br>•Vomiting<br>•Sense of lump in the throat<br>•Stomach ache<br>•Sore throat<br>•Hoarseness of voice<br>•Choking spells<br>•Voice change<br>•Excess salivation<br>•Gastric pain on awakening<br>•Halitosis (bad breath)<br>•Belching<br>•Heartburn | •Difficulty sleeping<br>•Failure to gain weight<br>•Feeding problems<br>•General irritability<br>•Asthma<br>•Recurrent pneumonia<br>•Anemia<br>•Bronchitis<br>•Laryngitis |

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1. Diagnose correctly
   1. Diagnostic Protocol
   2. Types of lesions
      - Carious vs **non-carious lesions**
2. Identify causes
   - (a. carious) & **b. non-carious lesions**
3. Restore
   - carious & non-carious lesions

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## When to restore: Factors to consider

Diagnostic protocol

Tooth lesion
Etiology

Size of lesion
Location of lesion

Biomechanic (force
Esthetic concern

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## Why, and when to restore? 1/2

- Facilitate self-cleansing and hygiene procedures
- Reduction of plaque retention
- Reduce risk for root caries
- Reduction of cervical dentin sensitivity
- Prevention of pulpal involvement
- Improvement of esthetics
- Re-creation of appropriate coronal tooth length

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## Why, and when to restore? 2/2

- Diminishment of the progress of a lesion, tooth flexure, and stress concentrations
- Strengthening of the tooth
- Prevention of root fracture
- Restoration of normal anatomic contours
- Improvement of gingival health and symmetry
- Maintenance of the gingival contour

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## Restorative material

### Alternatives

| | Veneer | GIC | Composite -GIC -hybrid | Composite resin |
|---|---|---|---|---|
| Esthetics | ++ | - | -/+ | + |
| Biological cost | - | ++ | + | + |
| Acid resistance | ++ | -- | -/+ | + |
| Wear resistance | ++ | - | -/+ | + |
| Longevity | ++ | --/+ | -/+ | --/++ |

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## Restorative planning

- Tooth preparation
  - Minimal extension
  - Supragingival margins
  - No extra undercuts or retention lock
  - Estimated force
    - No compression versus flexure of tooth
    - Wear type
  - Esthetics on anterior teeth and premolars

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## 1. Diagnose correctly

1. Diagnostic Protocol
2. Types of lesions
   - Carious vs **non-carious lesions**

## 2. Identify causes

- (a. carious) & **b. non-carious lesions**

## 3. Restore

- carious & non-carious lesions
  - Restoration
    - Composites & Bonding

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## Abfraction vs. Abrasion

Glassionomer or microfill composite resin

Hybrid microfill composite resin

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## Glassionomer cement-resin hybrids

Two subgroups

a. Material polymerises without light initiation

b. Light initiation is required

Most products contains 4.5%-6% resin

## Selection of restorative material? Composite resin vs. glassionomer

Cavity situation:

- Supragingival margin: moisture sensitive
- Cementum gingival margin
- Dentin substrate: sclerotic dentin(?), depth of preparation, tubule orientation

Etiology:

- High caries risk: need for F-
- Cervical abrasion: wear
- Abfraction: flexion

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1. Diagnose correctly
   1. Diagnostic Protocol
   2. Types of lesions
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2. Identify causes
   - (a. carious) & **b. non-carious lesions**
3. Restore
   - carious & non-carious lesions
     - Restoration
       - Composites & Bonding
4. Reduce risk
   - (a. carious) & **b. non-carious lesions**

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## Risk reduction – friction

**Decrease abrasive forces**

- Use soft toothbrushes and dentifrices low in abrasiveness in a gentle manner
- Do not brush teeth immediately after an acidic challenge to the mouth, as the teeth will abrade easily
- Rinsing with water is better than brushing immediately after an acidic challenge

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## Risk reduction – friction / stress / corrosion

**Decrease abrasive forces**

- Gentle use of soft toothbrushes and dentifrices low in abrasiveness
- No brushing immediately acidic challenges
- Rinsing with water after an acidic challenge

**Provide mechanical protection**

- Consider application of composites and direct bonding where appropriate to protect exposed dentin
- Construction of an occlusal guard is recommended if a bruxism habit is present

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## Risk reduction - corrosion

**Diminish frequency & severity of acid challenges**

- Decrease amount/frequency of acidic foods / drinks
- Acidic drinks should be drunk quickly rather than sipped. The use of a straw would reduce the erosive potential of soft drinks
- If undiagnosed / poorly controlled gastroesophageal reflux is suspected, refer to a physician
- In the case of bulimia, a physician or psychologist referral is appropriate
- A patient with alcoholism should be assisted in seeking treatment in rehabilitation programs

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## Risk reduction - corrosion

**Enhance acid resistance, remineralization and rehardening of the tooth surfaces**

- Have the patient use daily topical fluoride at home
- Fluoride can be applied in the office 2-4 times a year. A fluoride varnish is recommended

**Improve chemical protection**

- Neutralize acids in the mouth by dissolving sugar-free antacid tablets 5 times a day, particularly after an intrinsic or extrinsic acid challenge
- Dietary components such as hard cheese (provides calcium and phosphate) can be held in the mouth after acidic challenge (e.g., hold cheese in mouth for a few minutes after eating a fruit salad)

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## Risk reduction – friction / corrosion

**Enhance the defense mechanisms of the body (increase salivary flow and pellicle formation)**

- Saliva provides buffering capacity that resists acid attacks. This buffering capacity increases with salivary flow rate. Saliva is also supersaturated with calcium and phosphorus, which inhibits demineralization of tooth structure
- Saliva reduces tooth friction
- Stimulation of salivary flow by use of a sugarless lozenge or chewing gum should be encouraged

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Thank you for your kind attention

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