What determines the “state of the art” of orthodontics 2016? Where are we going? Slow or fast food?

Birte Melsen, DDS, Dr. Odont.

Is orthodontics a scientifically based discipline?

How has the development within these three disciplines influenced orthodontics?

Edward Hartley Angle, "the father of American orthodontics," gave six week courses and founded the Angle School of Orthodontia in St. Louis.

Orthodontics comprise:

- Anamnesis
- Diagnosis
- Problem listing
- Treatment planning
  - treatment goal
  - treatment principle
  - appliance design

Art and/or Science?

To diagnose is to determine the cause or nature of a problem!

Orthodontics comprise:

- Anamnesis
- Diagnosis
- Problem listing
  - involves analysis of images
  - Why did Platon not like images? He was limited to 2D

Which image is presenting the truth?
Was Problem listing based on cephalometric measurements more scientific? The variables depend on the stability of the cranial base –

The reliability of head film measurements

1. Landmark identification:

The engineers have improved the registration techniques

The distribution of the interincisal angle:

Orthodontics comprise

- Anamnesis
- Diagnosis
- Problem listing
  - Treatment goal
- Treatment principle
- Appliance design

Mostly Art and little Science!

Art influenced by science

Art or Science?

Science! But--------?
TREATMENT PRINCIPLES
Art or Science? Evidence based?
1. GROWTH ADAPTATION
2. GROWTH STIMULATION
3. GROWTH RETARDATION
4. COMPENSATION CORRECTION / SURGERY?
5. MANDIBULAR REPOSITIONING?
6. TOOTH MOVEMENT DENTALVEOLAR MODELLING

Less than 5% of orthodontic treatments are evidence based.

Treatment approach

Over time the problem solving has varied

Class II: Distalising or mesialising?
Crowding: Expansion or extraction?
Do we possess the truth?
NO!

Are the upper molars the key to the occlusion?
If so can we displace the molar?

Principles utilised for Orthodontic Anchorage

Effect of headgear - implant study

Total relapse of orthopedic and orthodontic effect
Nevertheless - 80 papers on molar distalization last 5 years

Tooth movement done with fixed appliances required wire bending to:
1. lower the force level
2. add first, second and third order bending
3. obtain the correct force system

Development within wire materials have wire bending for force level superfluous:

New wire alloys made bending for lowering the force level unnecessary.
Preadjusted brackets made
First second and third order bend superfluous?

Different prescription
Art or science?

Outsourcing of bending?
Bending for lowering the force level
First, second, and third order bending
Bending for correct force system??????

Are some brackets quicker?

Can we control the torque with brackets?

How is the control?
Can the use of prescription brackets ensure the control of the incisor inclination?
The intra-arch variation was reduced.

Where are we now? Outsourcing? "Fast food" Orthodontics " to go"?

Tooth movement done with fixed appliances required wire bending to:

1. lower the force level
2. add first, second and third order bending
3. obtain the correct force system

Development within materials have some wire bendings superfluous but:
What prevents Progress?

**Dogmas:** Always listen to experts. They'll tell you what can't be done, and why. Then do it.” — Robert A. Heinlein.

Midline displacement

*Burstone C.J.: Problem Solution; Quintessence*

“ It is not possible to correct a midline deviation if the incisors are not tipped” Should we accept that?

---

**Where are we today?**

How is the market influencing orthodontics?

- By catering to the doctors offering online courses:
  - The doctor don’t need to move to be educated
  - The doctor don’t need long courses
  - With a special system the income is increasing

- By developing products on demand
  - "screws"- TADs
Background: How did it all start? 1974
With patients where the normal anchorage systems could not be used
• More teeth against fewer teeth
• Maximum rigidity
• Differentiated Force System
• Free Anchorage
• Extra-Dental Intra-Oral - Zygoma wire

New Tools – A crutch or ‘new possibilities’?

Indications:
• Avoid displacement of the reactive unit during space closure
• Insufficient anchorage
• All teeth in the same direction
• Molar uprighting with intrusion
• Correction of asymmetry
• Intrusion of molars and premolars
• Built up alveolar process
• Alternative to surgery
• Supplement to surgery
• Prepare for reconstruction in degenerated dentitions

Should skeletal anchorage be used to:
➢ reduce the need for compliance? No, but
➢ facilitate treatment - shorten treatment time by producing:
- the correct force system for the desired combination of displacement and rotation

Maintenance of bone
Dog experiment.

Note the difference in the height of the crown.

3 YEARS 15 cases studied.

From Chiarlantini
Where are we today? How is the market influencing orthodontics?

By catering to the patients

- offering straight teeth fast and cheap

---

Where is the Research background important for us? Product development!!

In relation to the appliances. Hardware:

- Preadjusted Brackets
- Indirect bonding
  - Customized
  - Outsourcing?
- Wires
  - Standard pre-bend
  - Customized pre-bend
  - Outsourcing?
- Aligners
  - Clin check
  - Outsourcing?

Where has Research influenced our clinical practice? In relation to the appliances. Software:

- Force system
- Computer aided design?
  - New alloys?
- Design
  - Standard pre-bend wires?
  - Customised pre-bend?
- Biology
  - Host reaction?
Where are we?
- Better diagnosis
- Better understanding of the tissue reaction
- Better materials
- More outsourcing
- Better treatments
- For some or for all?

Is that the way forward?