Main Objectives:

1. To present a worldwide study results related to the standard of care (SOC) associated with orthodontic root resorption (ORR)
2. To present Orthodontitis, using biomechanics
3. To discuss: why the apex?
4. To present a recommended clinical protocol related to Orthodontitis

An anonymous questionnaire was sent by e-mails to WFO members worldwide

791 orthodontists from 93 countries responded

Several questions that will be discussed:
The orthodontists are divided by their seniority and the level of development of the country of practice

• What are the radiographs that you usually require/take prior to the orthodontic treatment?
• What are the type of radiographs by the percentage of orthodontists that use them during treatment?
• Are radiographs taken during treatment?
• What is the timing of radiographic monitoring during treatment?
• What is the response to detection of minor resorption or significance resorption?
• Are radiographs taken following treatment and what type?
• Are radiographs taken during retention and what type?
• Are radiographs taken before correction of a relapse?

• Dear WFO member
• My name is Atalia Wasserstein and I am an orthodontist and a WFO member.
• As part of my interest in root resorption concurrent with orthodontic treatment, I would like to conduct a survey of the attitudes of us, as orthodontists throughout the world, to know how we monitor this side effect of our treatment.
• Enclosed is an anonymous questionnaire consisting of 15 questions. It may take about 5 minutes of your time to answer it.
• You’ll be able to choose more than one answer to most of the questions.
• Thank you for your cooperation
The Biomechanics of Root Resorption – Naphtali Brezniak, Atalia Wasserstein

What is Orthodontitis?

Orthodontitis, is it a sign, a symptom or a disease?

The importance of naming a disease or a process
1. Gives existence
2. Points out on the uniqueness
3. Brings out validity and legitimacy
4. Explains reality
5. Naturalizes deviances (frame the disease)
6. Imposes status

Orthodontitis = Ortho+itis

How could it be that this inflammation was never named?

The importance of naming the inflammation behind tooth movement and ORR:
1. Iatrogenic
2. There is no Orthodontics without this inflammation
3. Its uniqueness:
   - 2 sides different processes (bone versus cementum)
   - 2 different expressions (stress versus strain)
4. Professional gain

May 2, 2016
2. Instrumental Orthodontitis (IO)

- No root shortening or other root surfaces’ changes can be detected clinically using external imaging technique
- 10%-15% of orthodontic patients
- Signs: toothache & mobility during treatment
- Symptoms: toothache & mobility during treatment
- Treatment: Painkillers, TLC

1. Instrumental Detrimental Orthodontitis (IDO1)

- minor to severe root-surfaces changes
- ~84% of the patients
- Signs: toothache & mobility during treatment
- Symptoms: toothache & mobility during treatment
- Treatment: Painkillers, TLC

2. Instrumental Detrimental Orthodontitis (IDO2)

- Extreme apical resorption (over 3rd of the root length
- ~ 1% of the patients)
- Treatment: Painkillers, TLC and Fixation
- Extraction is almost always – forbidden (malpractice!)

Inherent Defense Mechanisms (DM)

- Most of the body tissues have DM
- This DM reacts when the tissue (organ) are under threat (pressure, hypoxia, pathogens...)
- The quality and the quantity of the DM is individually determined
- Initially, the DM uses non specific, reversible tools
- Finally, the DM uses specific tools that might sacrifices tissues, organs, to save function and life

Does this lead to this?

Inherent Defense Mechanisms (DM)

- The blinking reflex (the corneal and menace reflexes)
- Upper airway DM protects the body from invasion of non-pathogens and pathogens invasion (mucous, cilia, non-specific and specific defense layers etc.)
The Biomechanics of Root Resorption – Naphtali Brezniak, Atalia Wasserstein

Biomechanics of orthodontitis and root resorption

1928-2015

Short term in-vivo human experiments’ design

- Helsinki Declaration approval
- Volunteer patients needed extractions
- Activation (4-12 weeks)
- Extraction
- Preparation
- Analysis
- Results
- Conclusions

The pressure on the root

Theoretical stress distribution in the periodontal membrane:
A – Translation. B – Center of rotation at the apex. C – Center of rotation at the incisal edge. D – Center of rotation between the centroid and the apex.

Burstone spoke about the stress distribution but not about their effect in the remodeling activity

Types of root resorption (RR)

Physiologic RR
- Root material fatigue (?)
- Mesial force (?)
- Eruption (?)
- Coupled inflammation remodeling
- Microscopic evidence

Pathologic RR
- Orthodontic force
- Other reasons
  - Tumor, impacted teeth etc. including idiopathic
- Microscopic and macroscopic evidence

Why the apex is the one that is eliminating?

Physiologic RR

- Instrumental
detrimental
Orthodontitis ID01+2
- Microscopic and macroscopic/radiographic evidence

Pathologic RR

- Uncoupled inflammation
- Microcalcification
- Personal susceptibility

Types of root resorption (RR)

Pathologic RR

- Orthodontic force
- Other reasons
  - Tumor, impacted teeth etc. including idiopathic
- Microscopic and macroscopic evidence

Why the apex is the one that is eliminating?
Summary

- The worldwide SOC related to Orthodontitis was presented
- Orthodontitis (IO and IDO) were discussed
- The biomechanics of the short-term in-vivo studies was argued
- The vulnerability of the apex was addressed
- A protocol to reduce IDO2 was proposed