Factors influencing aluminium foil test results in an irrigated ultrasonic cleaner

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Introduction

• Cleaning = a main sterilization’s step
  ➔ sterile medical devices

• Hollow instruments and some kind of clamps: cleaning and evaluation of its effectiveness are difficult to implement

• Irrigated ultrasonic cleaner +++

• Ultrasonic performance?
Ultrasonic activity

• An ultrasonic cleaner works mostly by energy released from the collapse of millions of microscopic cavitations near the dirty surface.

• The bubbles made by cavitation collapse forming tiny jets directed at the surface.

Schemes from C. Denis and A.
Cleaning results

Before...  
Ultrasonic irrigator

After...
**Current tests for ultrasonic cleaner**

- **Wavelength measures** with a probe

- **Phenomenon of cavitation**

  - Aluminium foil test
  - Sonocheck (colorimetric test)
Obviously !!

- Aluminium foil test:
  - easy
  - fast
  - cheap

- Aim of our study:
  - Factors influencing foil test results?
Methods

- Ultrasonic tank (25L)
- Demineralized water, enzymatic detergent (0.5%)
- Washing cycles: 3 minutes
- Strip of aluminium foil, around 100 x 100 mm attached on a test rack, was immersed in the tank
Results 1: Degassing time

• Determine the influence of degassing time before the washing cycle
• Tests with different degassing time (0 to 10 minutes) were performed with aluminium foil

> Light amelioration but not significant by increasing its time.
Results 2 : Type of tray

- Our tests highlight an influence of the type of tray:
  - No tray > openwork tray > supplier tray
Results 3: Type of water

- Demineralized vs tap water (°THf = 36)
- Foil appears much ruffled and perforated into tap water than into demineralized water
Type of water

- Degassing time seems to be more essential with tap water

Tap water

Demineralized water

1 minute

3 minutes
Results 4: Aluminium quality

- It’s important to always use the same type of aluminium sheet in order to compare the results (especially for thickness)

Thin foil

Thick foil
Comments

• For the whole experiments, we also used:
  ✓ a probe
  ✓ a sonocheck

• Results of probe: > 7
• Results of Sonocheck: +++ (yellow)
  ✓ Comparability?
Conclusion

• Great variability of foil test results
• Difficulties of comparison
  ○ foil vs probe
  ○ foil vs sonocheck
• Degassing time: reduced
• Use of an openwork tray for cleaning
  ➢ Better results for foil test → better results for medical devices cleaning
Thank you for your attention...