Report PULL THRU™ Cleaning Brush
September 2021

Purpose:
The purpose of these tests was to investigate whether:

- The PULL THRU ™ Cleaning Brush damages the biopsy channel during manual brushing.
- If there is existing damage, such as a kink in the channel, what impact does this have on the cleaning performance of the PULL THRU ™ Cleaning Brush.

Summary:
The test was performed with an Olympus CFHQ190L endoscope and the PULL THRU ™ Cleaning Brush: REF ZZ2642+1+SPUP+2200/NS.
A new biopsy channel was inserted into the endoscope to ensure any damage observed in the channel was attributable solely to the brushing of the channel.

Tests were performed by Rescope BV.

The brush used for the test

Procedure:

- Test for channel Damage
  After replacing the biopsy channel, the new channel was flushed with water to remove any dust or particles in the channel that might have been left during repair. A video of the inside of the channel was then made using a smaller endoscope. The endoscope makes it possible to look at the inside of the biopsy channel and take images when required.

  The pre-cleaning procedure was performed each time with a new PULL THRU ™ Cleaning Brush following the Dutch SFERD guidelines. A video was made of the inside of the channel after the 26th, 51st, 76th and 100th repetition of the procedure.

- Test using a damaged channel
  Using the old biopsy channel (the one removed from the CFHQ190L for repair) kinks were made in this channel.
  The tests described above were performed.
  We observed the PULL THRU ™ Cleaning Brush before and after the kink during brushing.
  We repeated the test with a regular bristle pre-cleaning brush.

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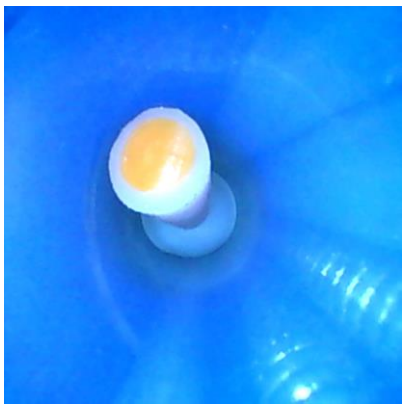
Observations:

- Test for channel Damage
  Inspection of the channel using the inspection endoscope after 26th, 51st, 76th and 100th brushing repetitions showed no evidence of damage from the PULL THRU Cleaning Brush.



The PULL THRU ™ Cleaning Brush in the biopsy channel

A regular bristle brush in the biopsy channel

- Test in the damaged channel
  The test with the kinked channel shows that the PULL THRU ™ Cleaning Brush is distorted and therefore does not touch the complete inside of the channel wall. The wipers revert to their original shape after the kink returning to their normal cleaning performance.

  The regular brush also does not touch the complete inside wall of the biopsy channel near a kink in the channel. If the regular brush is pushed too quickly forward the brush does not touch 2-3mm of the wall after the kink.

  The PULL THRU Cleaning Brush recontacted the wall much quicker after the kink.

The PULL THRU ™ Cleaning Brush in the kinked biopsy channel

The PULL THRU ™ Cleaning Brush in the kinked biopsy channel, outside the endoscope

A regular bristle brush in the kinked biopsy channel, outside the endoscope

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Conclusions:
No damage was observed in the biopsy channel when using the PULL THRU ™ Cleaning Brush.

The PULL THRU ™ Cleaning Brush is more effective than the regular bristle in cleaning the channel around a kink in the channel.

The conclusion is that the PULL THRU Cleaning Brush is more effective than the regular brush both in undamaged biopsy channels and channels with a kink.

Other Observations:
The wipers of the PULL THRU ™ Cleaning Brush completely seal the inside of the biopsy channel. This creates an effective vacuum behind each wiper. Each wiper of the PULL THRU™ Cleaning Brush loosens the contamination, the following wiper makes sure this is taken to the end of the channel. This ensures a high level of the contamination in the channel is removed, making the PULL THRU ™ Cleaning Brush highly effective and efficient.

We observed the regular brush changes more into a point when moved in the biopsy channel. If the brush is not moved backwards the debris is moved inside the channel but not removed.

With the standard brush, following the complete pre-cleaning procedure is necessary, especially the need to repeatedly brush all channels. Physically this is more of a burden on the cleaning staff. Especially as many endoscopes have multiple channels that need cleaning.

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