



To Borescope Or Not To Borescope

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Systems

VCU Health Systems

- One college and four health sciences schools
- An academic medical center
- A Level I trauma center
- One of only two NCI-designated cancer centers in Virginia
- The region's only full-service children's hospital
- More than 800 physicians in 200 specialties
- 845 Staffed Beds
- Through inpatient discharges, ER visits, Outpatient Clinics, and Surgeries we saw over a million patients in 2021

Background

- Centralized all flexible scopes and high-level disinfection to one department
 - Started in 2012
 - 5 strategically placed rooms throughout campus to cut down on delayed reprocessing.
 - Total inventory is 511 different flexible scopes and 591 other HLD devices
 - A total of 103 different flexible scope models
 - Staff is required to obtain a certification within two years of being hired (CER, CFER)
 - All staff must attend an entry class and pass a test before going into the rooms to work. (Usually last 3-4 weeks)

Staffing/Equipment

- Fully Staffed – 33
 - 4 Equipment Technicians
 - 1 Supervisor
 - 1 Coordinator
 - 1 Director
 - 26 HLD Technicians
 - Assistant Technician
 - Technician
 - Senior Technician
- Equipment
 - AER's – 23
 - Sterilizers – 4
 - Drying Cabinets – 23
 - Automated Leak Testers – 11
 - Automated Flushing Devices – 12

What Kind of Flexible Scopes

- GI Models of Flexible Scopes

- Colonoscope
- Sigmoidoscope
- Gastroscope
- Enteroscope
- Duodenoscope
- EUS Linear
- EUS Radial

- Other Models of Flexible Scopes

- Ureteroscope
- Cystoscope
- Bronchoscope
- EBUS
- Laryngoscope
- Choledochoscope
- Ventriculoscope

Non-Flexible Scopes

- Other Devices that come into the same rooms
 - 73 different models
 - Intracavity Probes
 - Surface Probes
 - TEE Probes
 - Endoscope Accessories
 - Ophthalmology Probes and Accessories
 - Rigid Scopes
 - Dilators
 - Expiratory Cassettes
 - Manometry

What is a Borescope?

- Webster dictionary defines a borescope as an optical device (such as a prism or optical fiber) used to inspect an inaccessible space (such as an engine cylinder)
- Purpose: Inspect for abnormalities such as discoloration, foreign objects, and deformed channels.
- Implemented this for all devices upon return from repair and before circulating new devices into HLD

2021 Borescope Stats for Flexible Scopes

- Only borescope new flexible scopes and all returning repaired flexible scopes
- Total devices reprocessed is 41,876
 - 26,169 were flexible scopes (covid-19 cancelled cases)
 - 120 flexible scopes were deemed broken and needed repair
- 37 new scopes were added into inventory

2021 Rejected Flexible Scopes

- 28 flexible scopes of the 120 repaired scopes were rejected.
 - 18 came from the OEM (Manufacturer)
 - 10 came from third party
- 8 flexible scopes of the 37 new scopes were rejected.
- A total of 36 flexible scopes were rejected. This equaled a 23% fail rate of overall flexible scopes that were either new to the facility or sent out to be repaired.

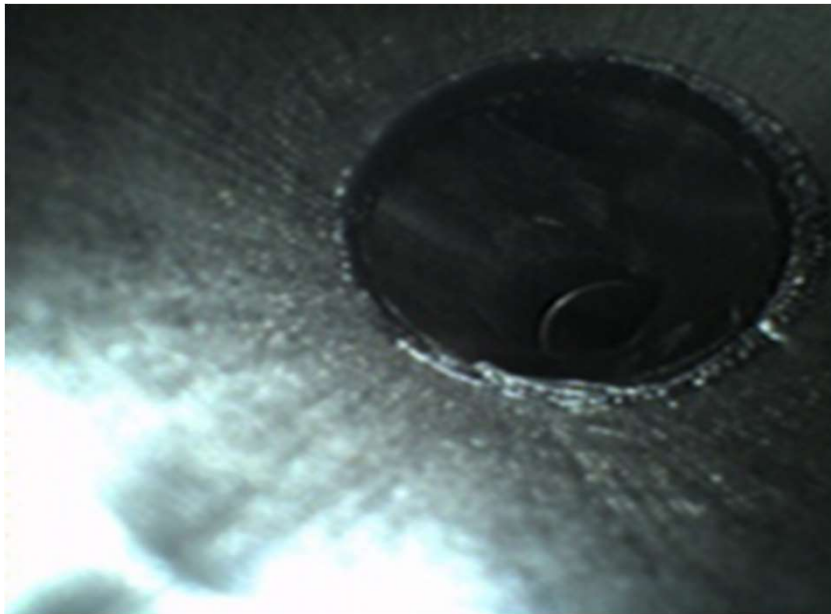
Rejected Flexible Scopes

The million-dollar question: why
where so many scopes rejected.

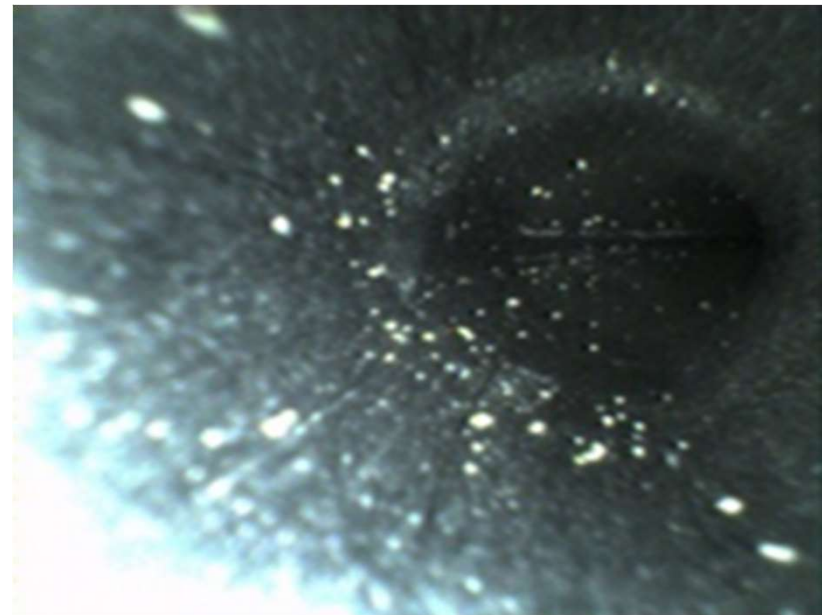


“OEM Repaired” Bronchoscope

Lifted edge along biopsy channel



Metallic particles present within the suction port

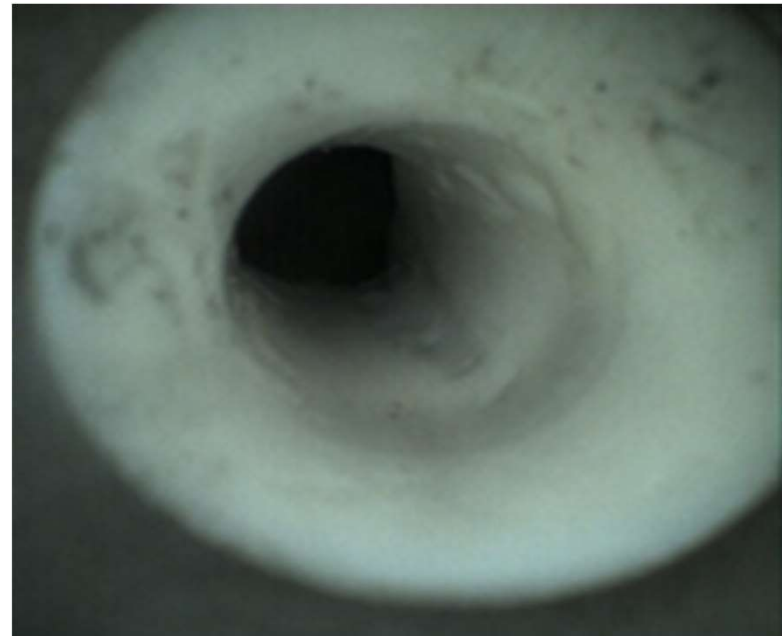


“3rd Party Repaired” EBUS

Pitting within Distal Tip

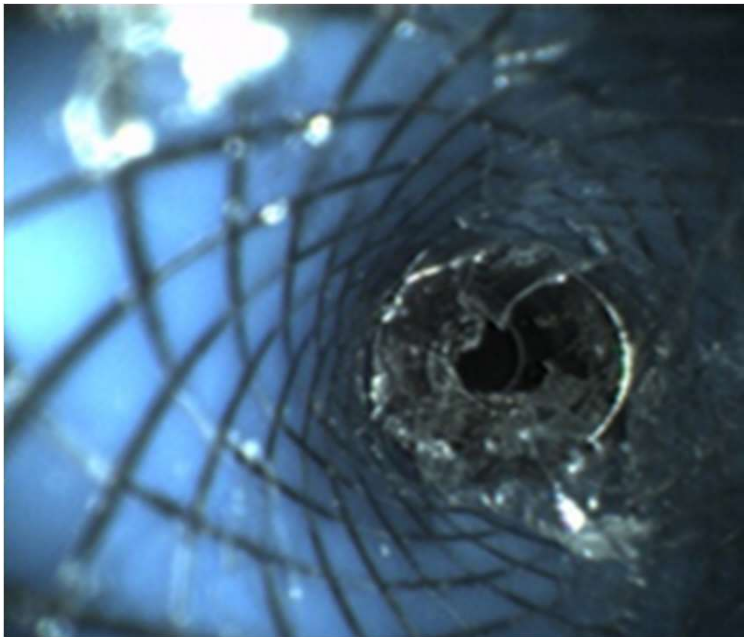


Pitting (Zoomed in)

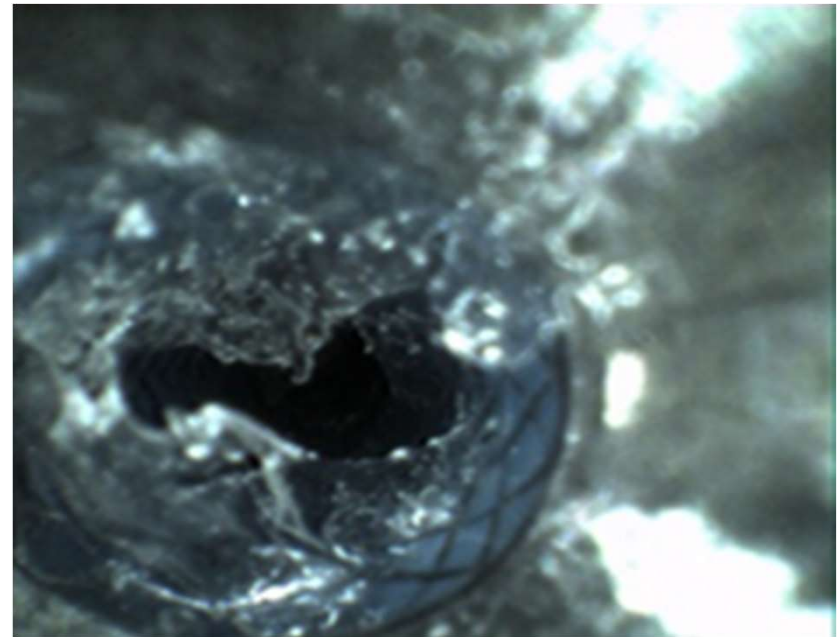


“3rd Party Repaired” Bronchoscope

Glue Blocking Instrument Channel

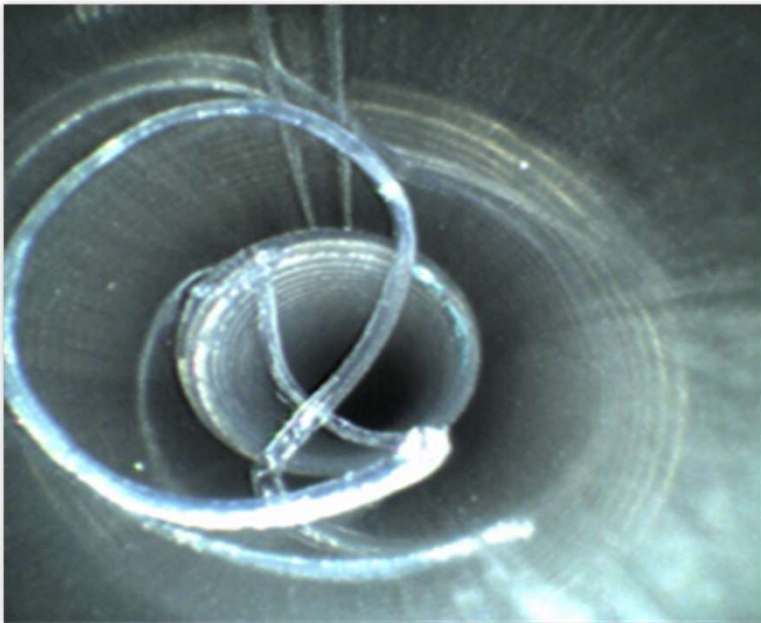


Blockage (Zoomed in)



“OEM Repaired” Gastroscope

Excess Silicone in Instrument Channel

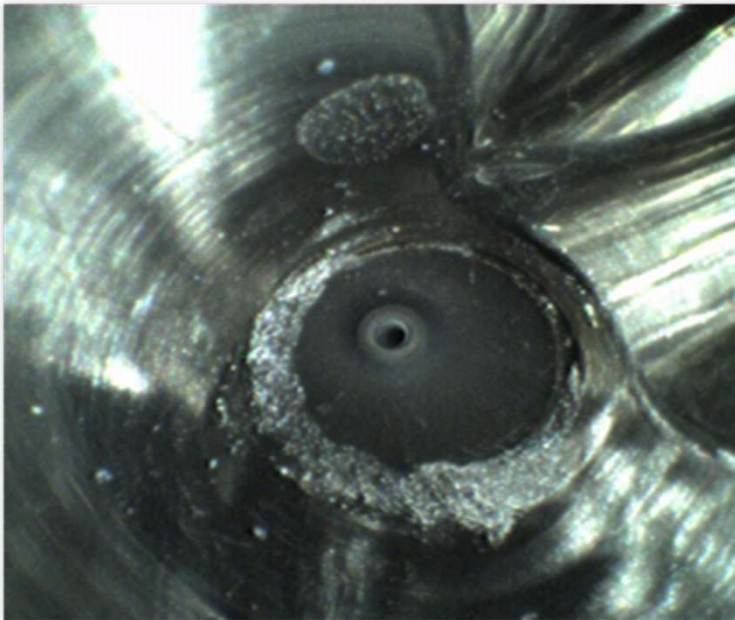


Foreign Substance in Instrument Channel

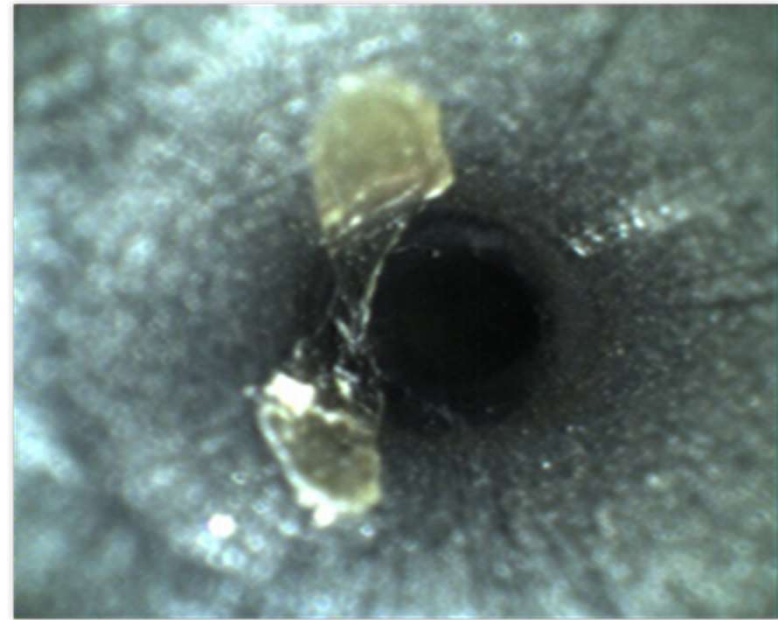


“OEM Repaired”

Foreign Substance at Seal

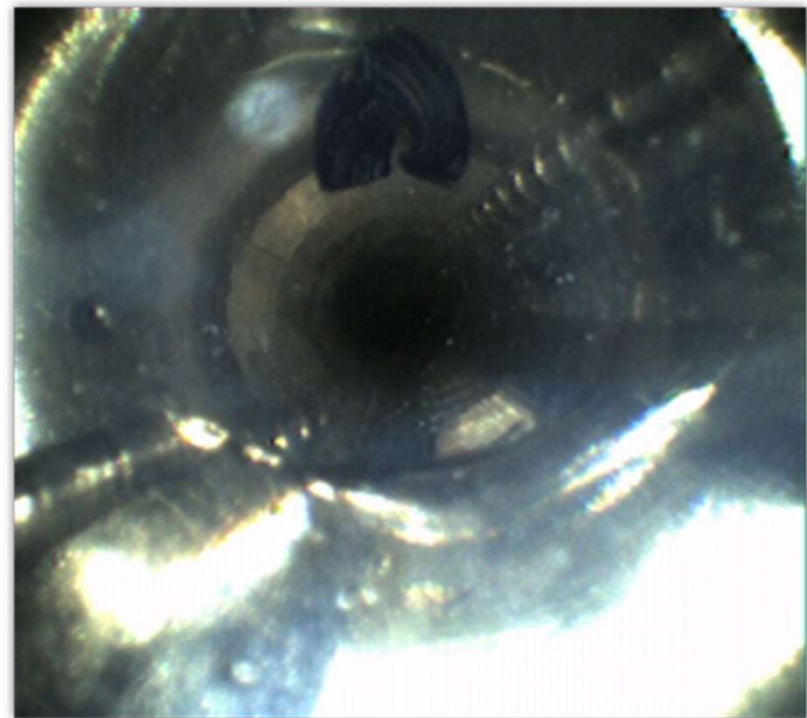


Foreign Substance in Water Feed Connector



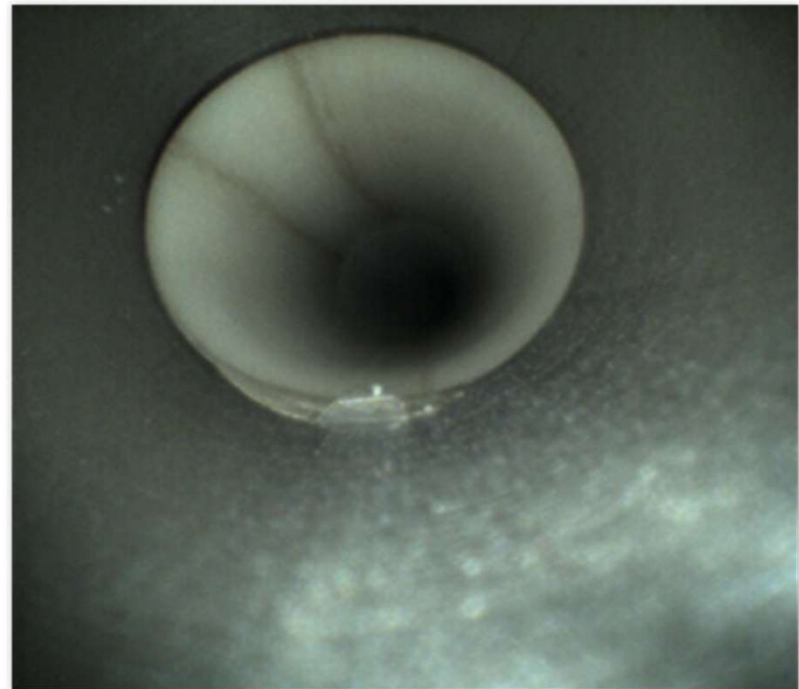
“3rd Party Repaired”

**Foreign Object in Instrument Channel
(clip/band)**



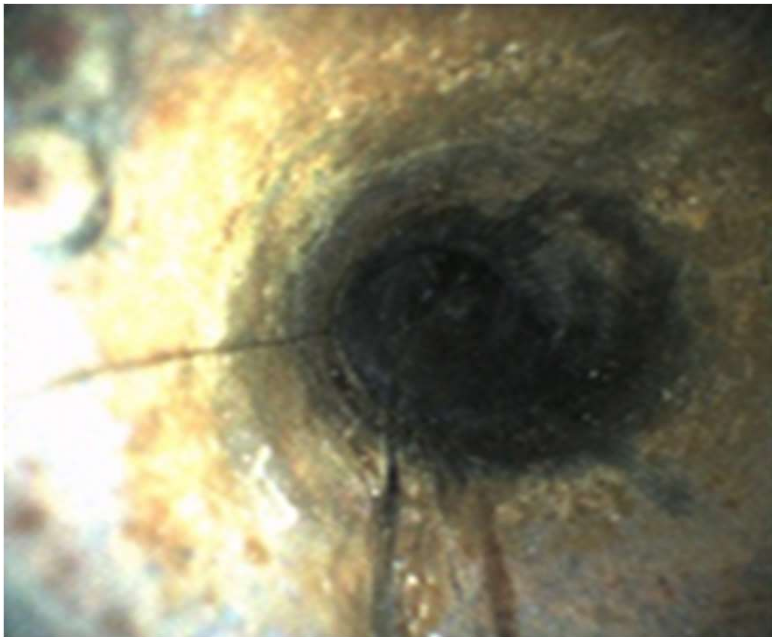
“3rd Party Repaired” Bronchoscope

Foreign Object in Instrument Channel

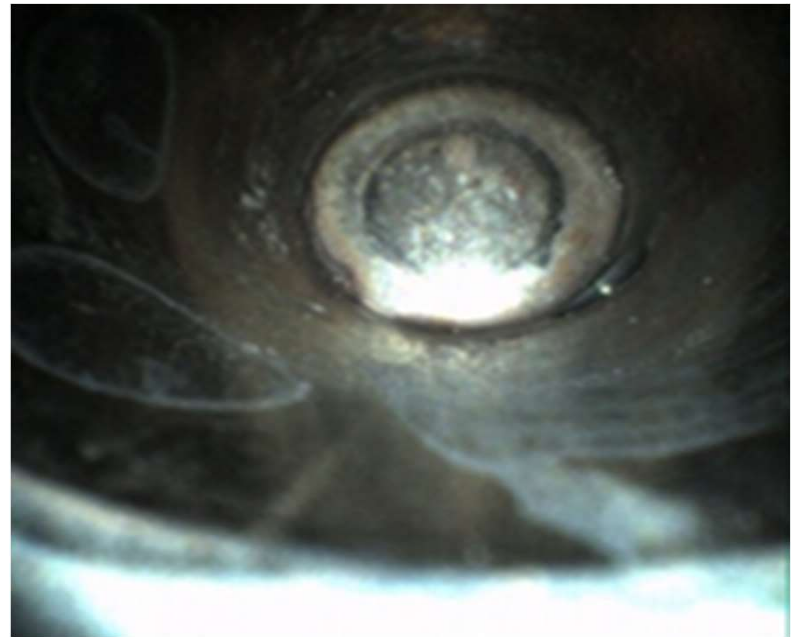


“Brand New” Sigmoidoscope

Discolored Suction Channel

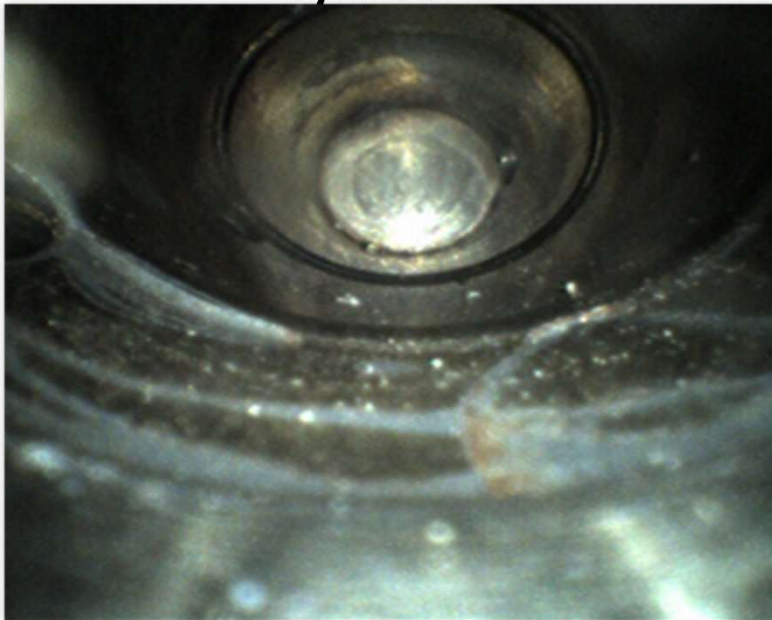


Discolored Suction Valve Cylinder



“Brand New” Sigmoidoscope

**Foreign Substance and
Discoloration in Air/Water Valve
Cylinder**



**Foreign Substance Discovered
After Brushing Channel**

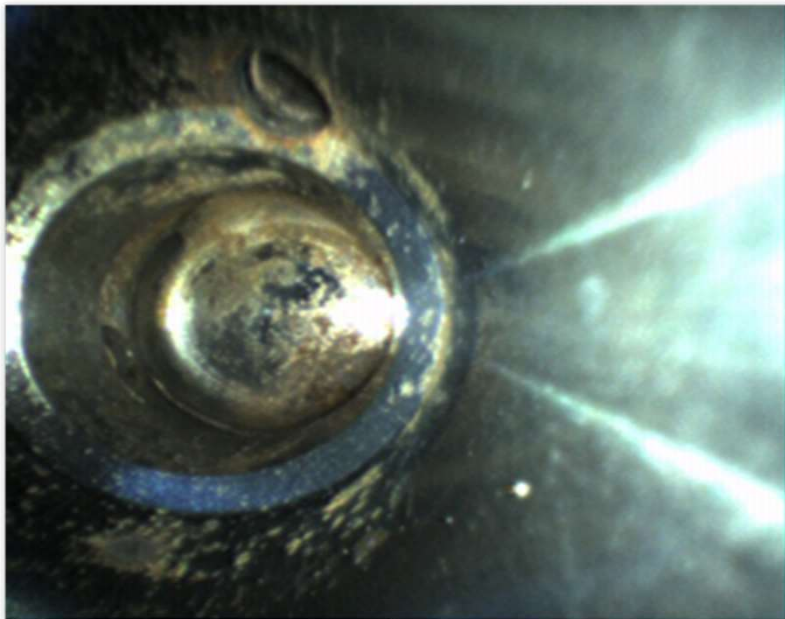


A Closer Look

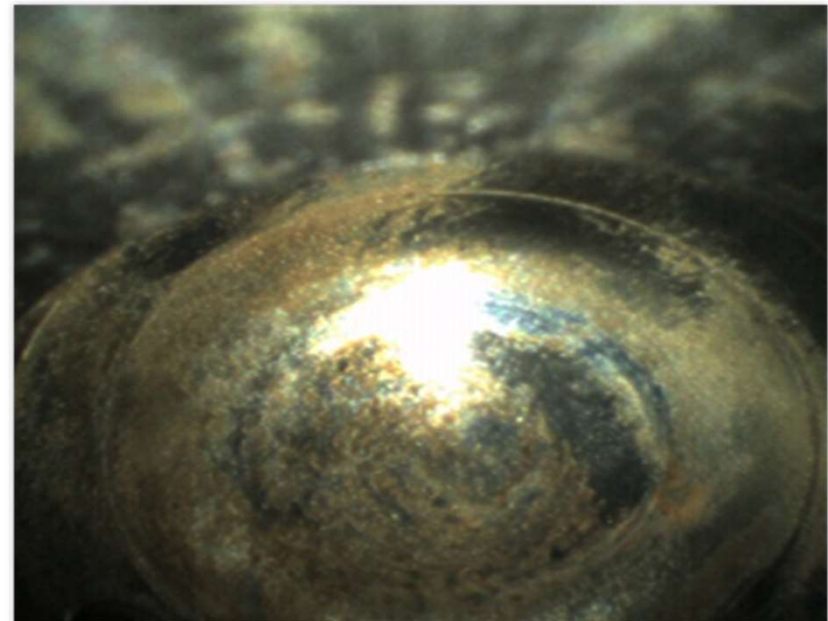


“Brand New” Neonatal Gastroscope

**Discoloration in Air/Water Valve
Cylinder**



Zoomed In



Conclusion

- With the percentages being so high, more organizations, groups, and people need to hold not just the third-party repair companies but the OEM manufacturers accountable.
- We currently have an agreement with a third-party repair facility and an OEM that all scopes sent to my facility must have a borescope to check the internal channels before shipping the flexible scopes back to us.
- With new technology available, we need to utilize it to prevent guessing at the quality of work being sent back to us to be used on patients.
- Any of the thirty-six flexible endoscopes that were rejected could have harmed a patient.
- How many have been missed in the past before we started using a borescope?

References

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