Clinician Perception of a Novel MRI-Derived 3D Model for Assessment of Perianal Crohn's Disease
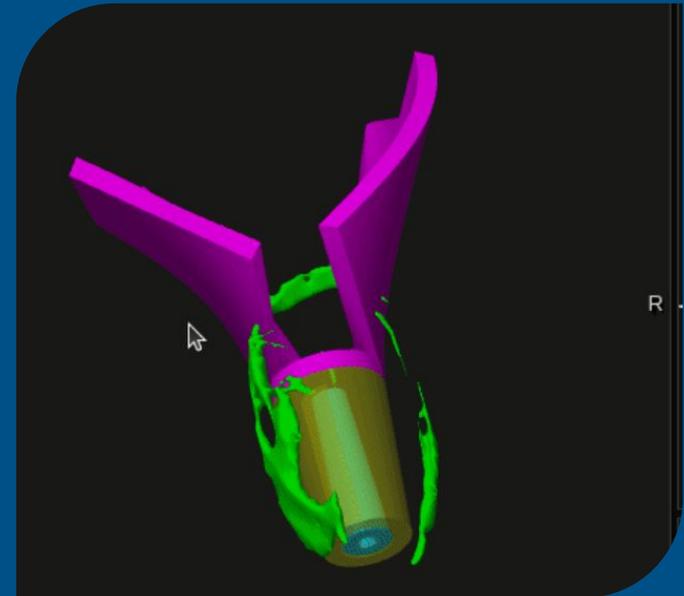
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Background: Perianal Fistula

- **Perianal fistula is a complex surgical condition that leads to a substantial impact on a patient's quality of life.**

- **In most cases, disease management requires involvement of three disciplines: colorectal surgery, gastroenterology, and radiology.**

- **Pelvic MRI is the gold standard for assessing perianal Crohn's disease (pCD). However, interpretation of complex fistula anatomy can be challenging for non-radiologists**

MRI scan

Radiologist

Written Report

Internal opening at 3 o'clock with intersection at…
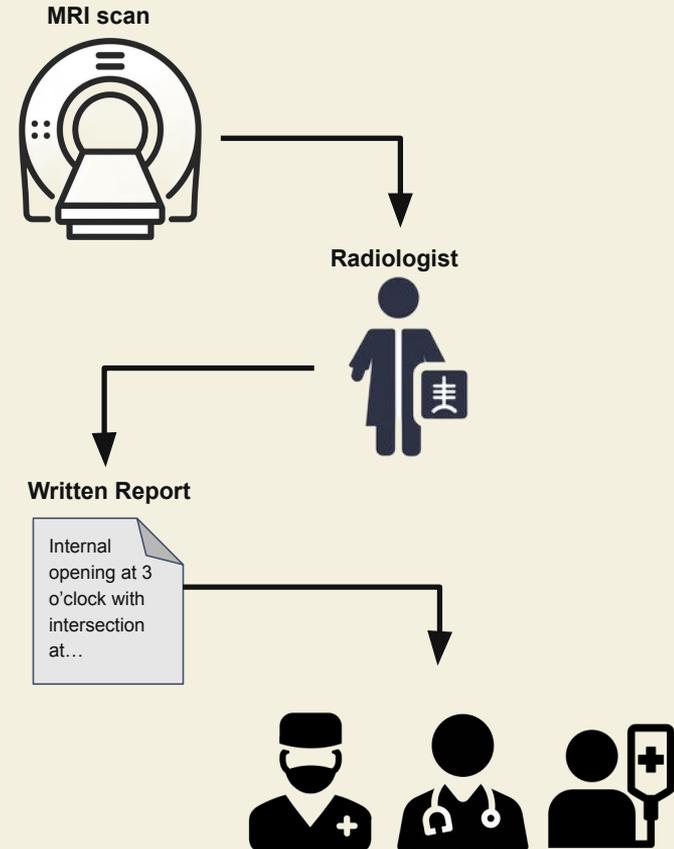
Background: Virtual Examination Under Anesthesia (vEUA)

- *vEUA* (Motilent Ltd) is an interactive tool that allows radiologists to create 3D models of the fistula and surrounding anatomy.

- By placing a few markups on the MRI scan, radiologists can generate the vEUA models within a few minutes.
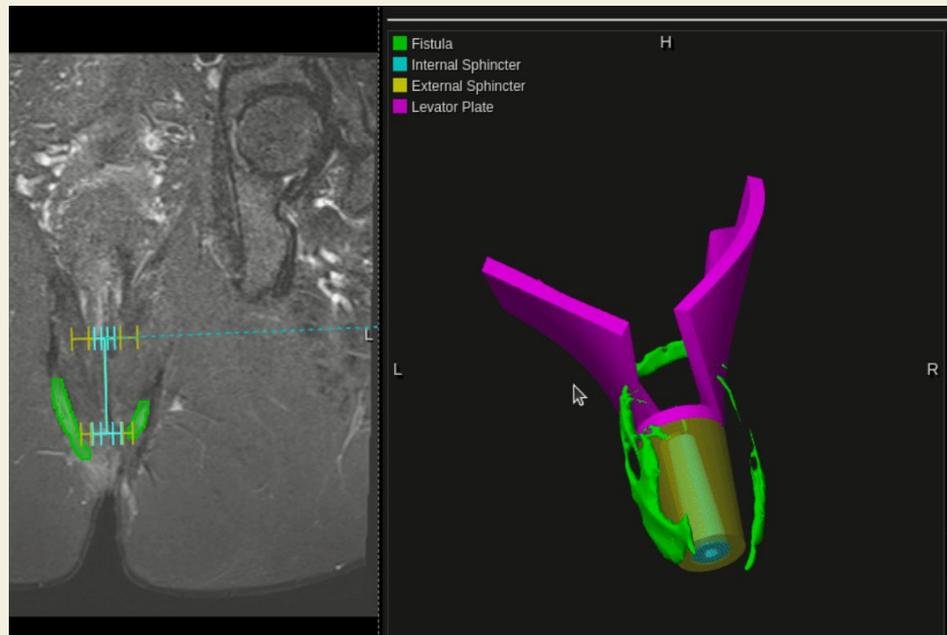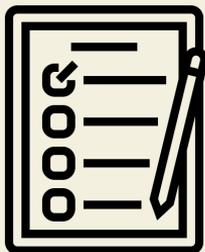
Methods

This multicentre observational study assessed gastroenterologist and surgeon attitudes towards vEUA and its perceived clinical utility.

Radiology Reports

Case 1:
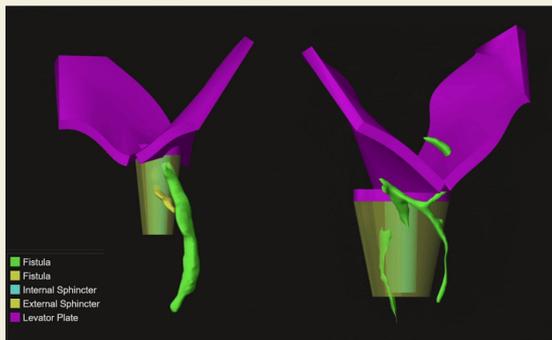Trans-sphincteric fistula with two internal openings.

Case 2:
Complex trans-sphincteric fistula with supralevator extension.
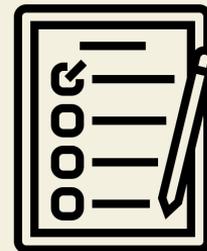
Survey Form

confidence in understanding pathology, clinical decision-making, and ability to provide patient education

vEUA models

Fistula
Fistula
Internal Sphincter
External Sphincter
Levator Plate

Repeat the Survey Form

Methods

Table 1: Survey - Gastroenterologists

How well does the report support your understanding of the fistula anatomy?
How well does the report support your overall clinical decision making?
How well does the report support your decision to refer for surgical evaluation?
How well does the report support your decision to start medical management (i.e. antibiotics or biologics)?
How well does the report support you in counselling, consenting or educating the patient about treatment options?
How well does the report support you in matters of training junior colleagues or peers?

Table 2: Survey - Surgeons

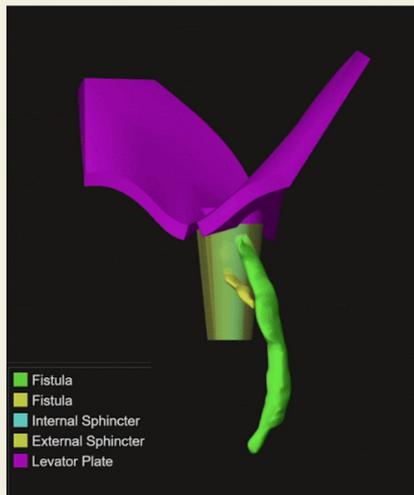| |
|---|
| How well does the report support your understanding of the fistula anatomy? |
| How well does the report support your clinical decision making? |
| How well does the report support you in counselling and consenting the patient of your advised course of treatments? |
| How well does the report support operative planning? |
| How well does the report support you in matters of training junior colleagues? |
| How well does the report support your understanding of the fistula anatomy? |

Results

Of 50 responses, 23 (46%) were **gastroenterologists** and 27 (54%) were **surgeons**. Amongst these, 17 (34%) were **trainees**.

Case 1: Trans-sphincteric fistula with two internal openings.

Case 2: Complex trans-sphincteric fistula with supralevator extension.

Fistula
Fistula
Internal Sphincter
External Sphincter
Levator Plate

19% Improvement in overall understanding

(MD 1.33 ± 1.71 points P < 0.001)

28% Improvement in overall understanding

(MD 2.16 ± 1.88 points P < 0.001)

Results

- The largest increases were seen in understanding anatomy ($P < 0.001$) and supporting operative planning ($P < 0.05$) for case 2.

- Gastroenterologists demonstrated greater improvements over surgeons in understanding fistula anatomy ($P < 0.01$) and overall decision making ($P = 0.01$) for case 1.

- Trainees demonstrated larger improvement in understanding fistula anatomy (<0.001) and overall clinical decision making (<0.005).

- Free text comments were received from 16 participants; 11 (69%) favored the vEUA model and 5 (31%) were neutral.

vEUA improves clinician confidence in understanding perianal fistula anatomy and supports management decisions, with greatest perceived benefit in complex disease and among non-expert readers.