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Magnetically controlled capsule endoscopy (MCCE) as an alternative for gastric evaluation

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Conventional capsule endoscopy (CE) is widely used for examining the gastrointestinal tract, especially the small bowel (SB) and colon.[1] Magnetically Controlled Capsule Endoscopy (MCCE) is an innovative approach for gastric evaluation, suitable for selected cases. The system utilises a magnetically controlled capsule operated by an external magnetic robotic C-arm, with two joysticks providing precise control orientation. For optimal stomach visualisation, the patient drinks at least 1 litre of water to float the capsule and distend the stomach, replacing air insufflation. The operator can then guide the MCCE for a comprehensive 360-degree assessment, aided by adjusting the patient's position, or use automatic mode, where the patient simply lies down after swallowing. In both modes, artificial intelligence detects key gastric landmarks (cardia, fundus, incisura, antrum, and pylorus).[2,3] MCCE offers detailed examination of both the oesophagus and SB. The external magnetic control can stop the capsule in the oesophagus after swallowing, facilitating the inspection of the oesophageal mucosa. After visualizing the oesophagus and stomach, the capsule naturally moves into the SB, functioning similarly to standard CE examining the entire SB.

We included 30 patients requiring SB evaluation (bleeding, Crohn's disease, anaemia, diarrhoea) excluding those with pacemakers or metal prostheses. All procedures were performed at Quironsalud Torrevieja Hospital using the NaviCam MCCE® (Ankon Technologies, Shanghai) from January to August 2025. One patient, unable to swallow the capsule, had it placed endoscopically. For the other 29 patients, the NaviCam Xpress robotic arm enabled comprehensive visualization of the oesophagus and stomach. The median patient age was 63 years (IQR: 48-70). Median transit times were 83 seconds (IQR 20-155) for the oesophagus, 50 minutes (IQR 34-75) for the stomach, and 305 minutes (IQR 233-433) for the SB. Complete, manually guided gastroscopy with MCCE took a median of 19 minutes (IQR 18-22). In eight cases (27.5%), the MCCE was advanced into the duodenum using external magnetic control. Gastric findings are detailed in figure 1, with additional diagnoses of oesophagitis in two patients and a hiatal hernia in one. (Fig. 2) MCCE revealed previously unknown findings in twelve patients, changing the management in two (gastric ulcers and oesophagitis).

Although gastroscopy remains the gold standard, MCCE's could be considered as an alternative in certain indications, as contraindication or refusal to standard gastroscopy, screening (cancer, varices, etc.), gastroscopies without biopsy, or pandemic situations must be evaluated with further investigations. To our knowledge, this is the first study using MCCE in Spain.

References

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Figure 1. Outcomes of magnetically controlled capsule endoscopy in stomach

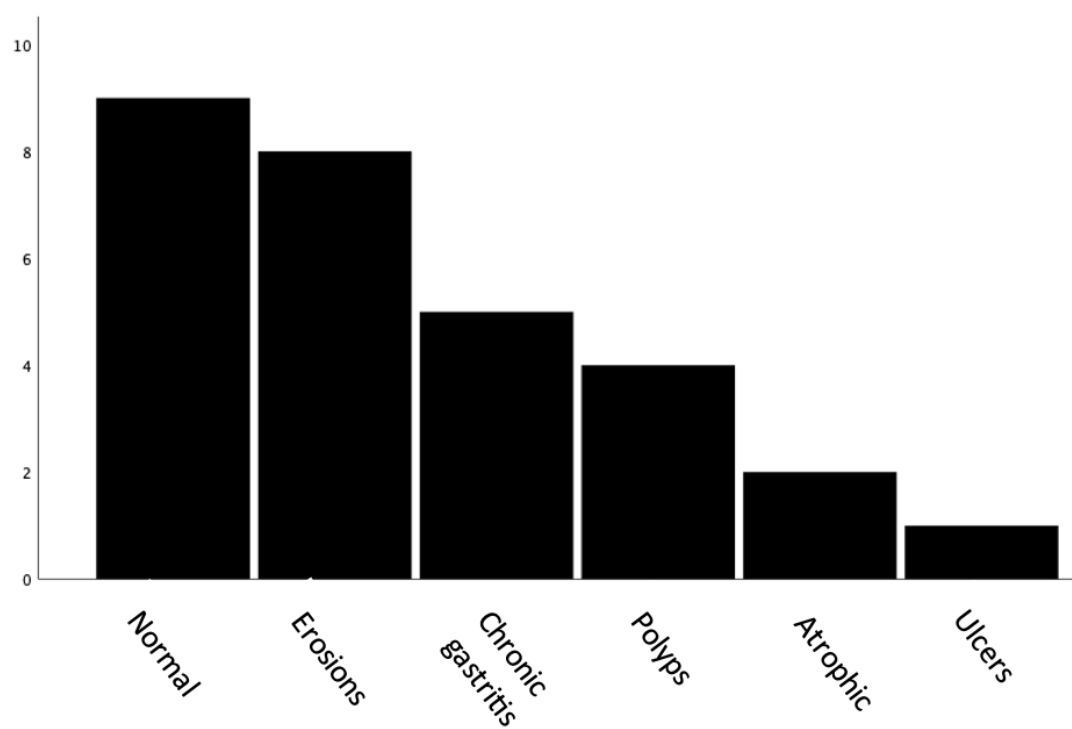


Figure 2. Collage of representative images obtained with Magnetically Controlled Capsule Endoscopy. Normal oesophageal landmarks: a) upper part, b) lower part, c) Z-line; and pathological oesophageal finding: d) oesophagitis). Normal gastric landmarks: e) fundus, f-g) body, h) incisura, i) antrum, j) pylorus); and gastric pathology: k) atrophic gastritis, l) polyp. Small bowel normal images: m) ampulla of Vater (blue arrow), n) jejunum; and small bowel pathology: o) angioectasia, p) ulcer.

