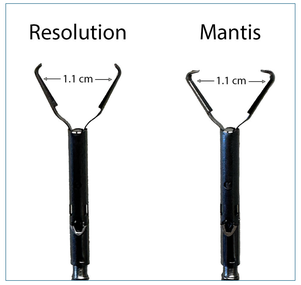
Insertion strategies, tips, limitations, and pitfalls regarding the use of standard and Mantis clips (Boston Scientific Corp., Boston, MA) to close large mucosal defects

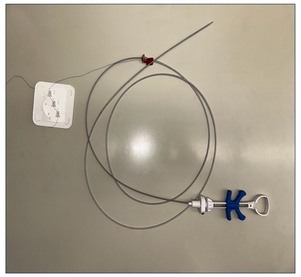
Palacios, P. [1], Mitra, N. [1], Riaz, A. [1], Portelli, K. [1], Nussbaum, J. [1], Kantarovich, D. [1], Shantha Kumara, HMC [1], & Whelan, R. L.[1]

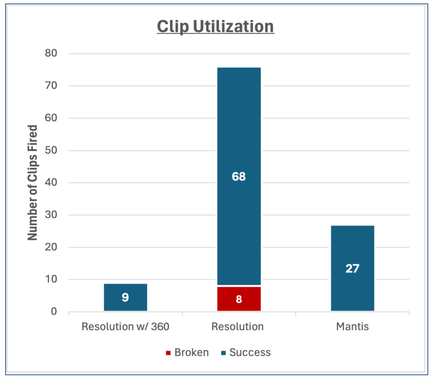
[1] Lenox Hill Hospital , Northwell Health, New York, NY

Introduction

- The ability to close colonic mucosal defects after EMR or ESD of sessile adenomas depends on wound size and location.
- Endoscopic clips are most often used although the X tack platform and Mantis Clip (Boston Scientific Corp, MA) are now options.
- The Mantis (M) clip is simpler but requires experience and a placement strategy.
- An ex vivo porcine colon study was carried out to assess the use of M vs. standard Resolution (R) vs. Resolution 360 clips to close mucosal defects.
- The X-tack joins large gaps, but placement is a challenge and not intuitive. Clips are more intuitive and easier to use.
- The purpose of this poster is to share placement strategies as well as pitfalls and limitations of the clips assessed.









Results

1. **Placement Technique**: Most wounds (85%) had the first clip placed mid-wound, while in a minority (15%), closure began at one side of the wound using a "zipper" approach.
2. **Number of Clips per Wound:** The mean number of clips per wound was 3.47. Wounds size ranged from 2 cm^2 - 8.52 cm^2 (diameters: 1.59cm – 3.29cm). Most wounds required 3 clips (60%), while others required 4-6 clips (40%). There was no direct correlation between the need for an M clip and the size of the wound.
3. **Effect of Grasp and Pull M Clips:** The use of grasp and pull M clips did not result in a decrease in the number of clips needed per wound to achieve closure.

Discussion

- Placing the first clip at the wound's side (zipper approach) and not the center may decrease the need for M clips because the gap bridged is smaller.
- As regards the M clip it is best to first grasp the distal wound edge and pull it proximally rather than taking the proximal edge distally (higher rate of dropped flap). Also, the incident angle between the clip and wound surface impacts placement.
- An acute angle (30-60°) subjects the distal clip leg to increased pressure during closure and may lead to clip bending/breakage.
- A 90° incident angle better distributes tension on the clip legs and is advised. 8 of 112 clips (7%) broke or were bent and failed soon after placement.
- R and M clips both can break if the gap being bridged is too wide. Use of the M clip for larger wounds is advised if difficulty is encountered with standard R clips.

Hypothesis

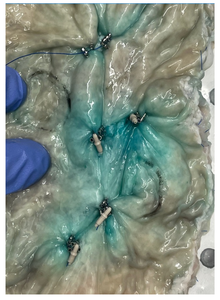
- The need for M clips to close 2-3 cm mucosal defects will decrease as the user gains experience closing mucosal wounds.
- M clips will facilitate the closure of large mucosal wounds not otherwise closable with standard clips.

Methods

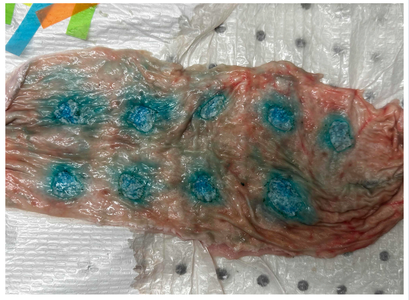
- In this preliminary study R clips and, if needed, M clips were used to close 30 porcine wounds in 6 colons. Closures were video recorded and analyzed. R and M clip insertion strategies as well as associated problems, challenges, and failures were noted.



a) Porcine Colon with 6 wounds reapproximated with varying clips



b) X-Tac Device deployed across a larger wound



c) Colon pelt and open wounds after removal of the clips

Conclusion

- Zipper vs center closure is advised for R clips and initial distal edge grasp and drag for M clips.
- A 90° incident angle between clip and wound is best for all clips.
- Clips failed in 7% of firings (no difference between clip types).

References

1. *McCarty, T. R., & Aihara, H. (2020). Current state of education and training for endoscopic submucosal dissection: Translating strategy and success to the USA. Digestive Endoscopy, 32(6), 851-860.*
2. *Keihanian T, other and MO. Colorectal endoscopic ESD: an update to best practice. Clin Exp Gastroenterology 2021 Aug 3;14:317-330.*