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Complications of endoscopic resection techniques for upper GI tract lesions



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Adverse events can occur during and after the endoscopic resection of upper gastrointestinal lesions. Their incidence can be minimized through the adoption of preventive measures and their final outcomes can be optimized through prompt identification and adequate treatment. In this evidence-based review we describe the risk factors for adverse events, preventive measures to avoid them and their management when they occur. Algorithms of action are also provided. Oesophageal strictures can be prevented with corticosteroids (either locally injected or systemically administered) and treated with endoscopic dilatation. Bleeding can be minimized through the adoption of prophylactic coagulation and novel preventive measures are emerging and being evaluated. Bleeding management includes coagulation therapy, clips and haemostatic powders. Perforations can nowadays be successfully treated endoscopically in the majority of the cases and conservative treatment is associated with favourable outcomes although optimal management is unclear.

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Introduction

Endoscopic resection (ER) is the most common therapeutic procedure in gastrointestinal (GI) endoscopy. ER in the upper GI tract became more frequent in recent years since the development of more advanced resection techniques like endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD), making ER an effective and minimally invasive treatment for epithelial and subepithelial lesions. However, with the increasing indications for ER and its increasing complexity, the number of adverse events (AEs) is expected to increase. The knowledge of how to prevent and how to manage them is thus of unremarkable importance and should be included in the training programs. In this evidence-based review we aim to summarize the incidence, risk factors, prevention strategies and the management of AEs when they occur.

Oesophagus

EMR and ESD are indicated for the resection of oesophageal squamous cell carcinoma and adenocarcinoma with absent or minimal risk of lymph node metastasis [1]. European guidelines recommend ESD as the first option for en-bloc resection of squamous cell cancer while EMR is the first line for Barrett's adenocarcinoma, being ESD reserved for selected cases [1]. ESD is also an alternative to multiple EMR sessions and/or radiofrequency ablation for residual Barrett's, carrying the disadvantage of increased complications, particularly perforation. EMR or ESD have also been shown to be effective and safe in the treatment of subepithelial lesions [2,3]. Endoscopic polypectomy in the oesophagus is nowadays only indicated in pedunculated or sessile lesions without malignant potential (e.g. inflammatory or hyperplastic polyps).

Bleeding, perforation and strictures are the most frequent AEs associated with oesophageal ER.

Bleeding

Significant bleeding occurs in approximately 2.8% of oesophageal resections [1] and is less frequent than in the stomach, which is possibly related with lower acid exposure. Recent meta-analysis found no differences in bleeding rates with EMR and ESD [4,5]. The role of proton-pump inhibitors (PPIs) in oesophageal EMR/ESD is not completely clear as there are no trials comparing different strategies and the majority of the studies do not report if PPIs were used to prevent bleeding and promote healing. A recent randomized controlled trial (RCT) showed no significant benefit with PPIs in post-procedural pain, post-procedural bleeding (PPB) or ulcer healing, although bleeding was more frequent in the non-PPI group (3% vs 0%, $p = 0.20$) [6]. As evidence is scarce, further studies are needed to clarify the role of PPIs and theoretically PPIs are useful at least after resection of lesions located in the lower oesophageal third.

Minor bleeding occurs frequently during ESD and is most of the times easily controlled. However, bleeding should be minimized as it worsens visualization and may increase the risk of other complications. Traction methods and transparent caps are sometimes useful to improve visualization and allow identification of vessels in order to coagulate them before dissection. Prophylactic coagulation is performed with the knife in coagulation mode (for small vessels) or with haemostatic forceps/grasper in larger vessels. Another key factor to decrease bleeding risk (both immediate and PPB) is complying with the recommendations regarding antithrombotic management in the peri-endoscopic period [7,8].

When bleeding occurs, the use of water jet is useful to clear the field and identify the bleeding point. Oozing bleeding can be controlled with the tip of the knife in coagulation mode, bearing in mind that coagulation should be as brief as possible to minimize transmural injury. Haemostatic forceps are preferred in cases of more active or spurting bleeding. The bleeding point should be grasped, elevated slightly and coagulated applying soft coagulation. Haemostatic clips can also be considered if the previous measures are unsuccessful, although its placement can be difficult and even compromise further resection; in some cases, continuing the dissection around the bleeding point before clip placement may be a better option. Haemostatic powders can be useful as a rescue therapy, particularly in diffuse oozing bleeding. PPB can be managed with the same therapies described above, with or without adrenaline injection. Before endoscopic therapy, the patient should be stabilized as

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