EDITORIAL

Interventional Endoscopy— Opportunities and Limitations

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Editorial to accompany the articles:

„The Periprocedural Management of Anticoagulation and Platelet Aggregation Inhibitors in Endoscopic Interventions“ by Christian M. Lange and

„The Endoscopic Treatment of Iatrogenic Gastrointestinal Perforation“ by Arthur Schmidt et al.

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More than 4.5 million endoscopies are carried out in Germany each year. Every single one of these interventions entails the risk of bleeding or visceral organ perforation.

Procedure in anticoagulated patients

The article by Christian M. Lange and colleagues provides guidance to estimate the bleeding risk involved in endoscopic interventions (1). They conclude that it is unnecessary to stop anticoagulation treatment in patients undergoing a procedure with a low risk of bleeding. With a small number of exceptions, patients undergoing interventions associated with high bleeding risk do not require bridging with heparin (2).

Peri-interventional bleeding results in delayed restart of anticoagulation treatment. At the same time, the complication induces a typical acute-phase reaction with reactive increases in thrombocyte count and coagulation factors. This is why the risk of thromboembolic complications is relatively low up to the time of endoscopy but rises from around 3 days thereafter, particularly in the case of major interventions or following peri-procedural bleeding (3).

In patients who do require bridging, low-molecular heparin in therapeutic dosage should be discontinued 24 h before endoscopy (with individual decisions in those at high risk, e.g., in the presence of an artificial mitral valve). Treatment with fondaparinux before interventional endoscopy is contraindicated owing to its long half-life (17 h).

Phenprocoumon has a paradoxical procoagulatory effect in the first 3 to 5 days of (resumed) consumption. It also inhibits carboxylation of the anticoagulatory proteins C and S, which have a shorter half-life than the procoagulatory coagulation factors. This results in transient protein C deficiency. Therefore, (resumed) treatment with phenprocoumon should always be accompanied for the first 5 days by low-molecular heparin in prophylactic dosage (4).

Peri-procedural management of patients treated with non-vitamin-K-dependent oral anticoagulants (NOACs) is simpler than the authors suggest. Nevertheless, it can be challenging to establish for certain that no anticoagulants have been taken. In the case of doubt, this can be verified by determination of the thrombin time (dabigatran) or anti-factor Xa activity

(all other NOACs) prior to a procedure associated with high bleeding risk. Determination of prothrombin time (Quick test) or activated partial thromboplastin time (aPTT), on the other hand, permits no useful conclusions.

Bridging with heparins is also pointless in patients who are taking thrombocyte function inhibitors, because heparins cannot then exert a sufficient effect on thrombocyte function. High-risk patients—such as those with acute coronary syndrome or implantation of a stent within the previous 3 months—may constitute an exception, because then at least additional thrombin formation can be restricted.

No anticoagulant or thrombocyte function inhibitor should be administered in the morning of the day of endoscopy. All anticoagulants—with the exception of phenprocoumon—exert their maximum effect around 4 h after intake or injection, so that an intervention between 10 a.m. and 2 p.m. would be taking place at the time of peak activity.

The effect of thrombocyte function inhibitors usually persists for several days owing to irreversible inhibition of the thrombocytes, but the active substance stays in the bloodstream for only a few hours. In the event of bleeding complications, adequate hemostasis can (rapidly) be achieved by infusion of two bags of concentrated thrombocytes (5). Unfortunately this is not true for ticagrelor (active substance persists for >60 h), so bleeding is harder to bring under control in patients on this P2Y₁₂ inhibitor.

Treatment of patients with visceral organ perforation

An additional complication of endoscopy is visceral organ perforation. Arthur Schmidt and his colleagues discuss the opportunities of endoscopic treatment for these iatrogenic injuries (6). No randomized controlled trials for this indication and its treatment are available. The case series that have been published on this topic naturally come from centers with high expertise. Whether the reported complication rates apply to non-specialized centers remains to be seen.

Highly relevant for treatment success is the time of diagnosis of a visceral organ perforation. CO₂ insufflation during examination is recommended for all interventional procedures with an elevated risk of perforation.

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The authors propose a management algorithm for the treatment of iatrogenic perforations (7). In this algorithm they do not discuss the role of percutaneous drainage in addition to interventional closure.

For esophageal perforations, insertion of a mediastinal drain following endoscopic treatment, in addition to administration of antibiotics, has been described in 55% of cases (8). Percutaneous drainage may also be useful in abdominal perforation and should be considered as an additional measure in the presence of fluid retention without pronounced peritonism.

Stent migration occurs in over 20% of cases of esophageal perforation (8). In the absence of clinical improvement it is recommended to check the position of the stent without delay.

The available literature does not allow to give a strong recommendation on when a visceral perforation with endoscopic closure should be followed by a contrast enhanced CT-scan to evaluate the therapeutic response. As endoscopic treatment of visceral organ perforation is not yet standard of care we recommend to monitor treatment success by contrast enhanced CT-scan before discharging the patient.

A major technical improvement in the treatment of perforations of the gastrointestinal tract is occlusion by means of over-the-scope clips (OTSC). Depending on their location, these clips may lead to motility disorders or obstruction of the lumen, so it is useful to be aware of the possibility of clip removal (9).

Prospects

The two articles discussed here are highly relevant for endoscopic practice. Interventions involving a low risk of bleeding will in future be carried out in patients on anticoagulants without interrupting their drug treatment. With the necessary expertise, any bleeding that may occur can be effectively controlled, not least by means of new techniques such as rotatable hemostasis clips or Hemospray (10). No bridging will take place in most patients (exception: high-risk patients) undergoing interventions with a high risk of bleeding, because bridging increases the bleeding risk. In the framework of an interdisciplinary multimodal algorithm, endoscopic closure of visceral organ perforations is a realistic treatment goal. Broadening of the indications for interventional endoscopy is safe and desirable.

Conflict of interest statement

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