

Response to letter on endoscopic ultrasound-guided thrombin injection a management approach for visceral artery pseudoaneurysm: case series



We are thankful to Agarwal et al. for commenting on our recent article and summarizing the studies on percutaneous and endoscopic ultrasound (EUS)-guided thrombin injection in management of visceral artery pseudoaneurysms (PSAs). Our prospective study on a novel treatment approach for management of visceral artery PSAs on the largest number of patients ($n=8$) in the literature revealed that EUS-guided thrombin injection is effective and safe. The technical (100%) and clinical (87.5%) success rates were very high at the end of 6 months without any significant embolic events.

In our study patients, standard management with coil embolization was refused by an interventional cardiologist and radiologist because of inaccessibility of PSA by the endovascular route, presence of large walled of necrosis, hemodynamic instability, and financial constraints. Our management approach was successful even in large PSAs and those that originated from main vessels. The EUS-guided approach is minimally invasive, painless, and can be done under conscious sedation without any significant adverse events. High resolution, proximity of vascular pathology near the gastrointestinal tract wall, and real-time guidance offer precise delivery of the intervention by EUS.

Agarwal et al discussed ultrasound-, fluoroscopy- and computed tomography-guided percutaneous approaches for management of visceral artery PSAs and concluded that the percutaneous approach was easy, quick, less invasive and cheap compared to other methods [1]. Actually, the percutaneous approach is not a new treatment for visceral artery PSAs and had been described in literature years ago, and most of those studies are case reports and retrospective without long-term follow up data on patients [2–5]. Human thrombin was injected in a

study for percutaneous treatment of femoral artery PSAs in 14 patients, without any complications [4]. The largest study on 85 patients, which was retrospective, revealed that percutaneous ultrasound guided thrombin injection is a quick, effective, and safe treatment for iatrogenic femoral artery PSAs, but the method was ineffective in large PSAs [5]. The retrospective study by Agarwal et al on 19 patients showed that the success rate for the percutaneous approach was only 52.6% and the success rate for PSAs originating from the main visceral artery was only 16.5%. The success rate for pancreatic PSAs was only 30% while in our study, pancreatitis-related PSAs were most common and a 100% success rate was achieved with treatment. Agarwal et al concluded that the percutaneous approach was more effective in peripherally located PSAs and less effective in large and PSAs arising from the main visceral artery. Our study revealed that EUS-guided thrombin injection provides an alternate novel option for management of visceral artery PSAs. It is most useful in patients in whom endovascular coil embolization is not possible or in patients who have a high surgical risk, but can be used in all patients because it is simple, minimally invasive, effective, and cheaper than angioembolization. Further larger studies with long-term follow-up are required to prove the efficacy and safety of the procedure.

Competing interests

The authors declare that they have no conflict of interest.

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