

GUIDELINES FOR GASTRIC VARICEAL INJECTION WITH CYANOACRYLATE GLUE (HISTOACRYL)

Rationale:

Although the incidence of bleeding from gastric varices is relatively low (10%–36%), bleeding can be massive, and is associated with a high mortality.

Background:

The management of gastric varices is different to the management of oesophageal varices. Cyanoacrylate injection is widely used for treatment of gastric variceal bleeding since its first introduction in 1987.

Cyanoacrylate glue (Histoacryl) is composed of enbucrilate; in the presence of any moisture it immediately polymerises into a solid substance. When injected into a varix, luminal obliteration occurs on contact with blood thus forming a haemostatic plug. This cast is eventually sloughed through a mucosal ulcer and passed into the gastrointestinal tract.

Lipiodol is a radio-opaque lipid-based contrast solution. It is used to suspend the cyanoacrylate and serves to retard hardening of the glue within 20 seconds, as well as allowing radiographic monitoring of the procedure.

Studies have shown that injection with cyanoacrylate glue is one of the most effective treatments for gastric varices in controlling acute haemorrhage as well as reducing rebleeding rates.¹⁻⁴ Complications of Cyanoacrylate injection include sepsis, embolisation, esophageal perforation, and splenic infarction with case reports of coronary emboli, cerebral stroke, and portal vein embolisation. Both fatal and non-fatal pulmonary embolism (PE) from glue injection have been reported.

Retrospective and prospective studies indicate that the risk of embolisation correlates with volume of injection. Six out of 140 patients (4.3%) who developed PE were given a mean volume of > 4.2 ml compared to 1.8 ml for those without PE. Alexandar *et al.*⁵ reported volume and speed of injection and the size of gastric varices as risk factors for embolisation. Patients with isolated gastric varices may have spontaneous gastrosplenic shunts that predispose them to PE and so may not be good candidates for glue injection. A retrospective study analyzing complications arising in 51 of 753 patients treated with cyanoacrylate injection showed favorable outcomes when using less volume of Lipiodol, however, mortality was not reported following embolism. Seewald *et al.*⁶ also supported evidence for a safe injection technique with volume of injected glue mixture limited to 1 ml for each session to prevent embolic complication.

PROCEDURE

Safety:

- Histoacryl glue can cause injury upon contact with eyes and skin, thus safety goggles and gloves for all staff in the room at the time of the procedure is paramount.

Equipment:

- Standard equipment for endoscopy
- 23 gauge Marcon-Haber Varices injector, a metal luer lock is required to prevent melting of plastic hubs by glue
- 6 X 2ml luer lock syringes
- 2 X 20ml luer lock syringes
- 2 X 10ml Lipiodol ampules
- 2 X 0.5ml Histoacryl glue ampules
- 4 X 10ml sterile water
- 2 X 19 gauge sterile drawing-up needle
- Medilube (silicon) spray
- Disposable Scissors (or scissors sprayed with Medilube)
- Sterile gauze

Please note:

- Remember to keep all surfaces dry as Histoacryl glue solidifies immediately upon contact with water.
- If suction channel becomes contaminated with body fluids, flush with water and respray with Medilube prior to inserting variceal injector.
- **Do not remove injector or withdraw injector into endoscope as glue may block and permanently damage scope.**

Preparation of Equipment:

Endoscope:

- Spray the gauze with Medilube and apply this to the Marcon-Haber injector tubing
- Spray Medilube on the external surface of the distal 30 cm of the external portion of the endoscope's insertion tube
- Spray Medilube inside the biopsy port at the distal end as well as the proximal insertion port of the endoscope

Injection Fluids:

- Using 4 X 2ml luer lock syringes, draw-up 1.5mL Lipiodol into each syringe
- Cut top of Histoacryl glue bottle with disposable scissors, ensuring you cut close to the hub to allow access of drawing-up needle
- In the other 2 X 2ml luer lock syringes draw-up 0.5ml Histoacryl glue, then add 0.5ml Lipiodol to the mixture (1ml in each syringe in total, gently mix until the purple colour is evenly distributed)
- Fill 2 X 20ml syringes with sterile water
- Further syringes may be required if more than 2 injections are required, taking into account the increased risks after more than 4mL of mixture is injected.

Injector:

- Prime injector with Lipiodol mixture taking note of the dead space volume
- Further prime injector with the Histoacryl glue/Lipiodol mixture to within 10cm of needle end, and make a note of this volume. Leave this syringe attached to the needle unless it is completely emptied.

Procedure:

1. Proceed to gastroscopy as normal
2. Once gastric varix identified, pass injector down the biopsy channel into the stomach keeping the Histoacryl/Lipiodol mixture syringe attached to the injector (the assistant must be careful not to accidentally press the syringe and allow glue to leak from the catheter tip)
3. Push needle out of catheter (sometimes this is impeded by retroflexion, and the needle must be pushed out of the catheter with the scope straight, before “J” manoeuvre is performed to visualise the fundus)
4. Insert needle into varix. (Imaging Intensifier can be arranged to assist procedure)
5. Inject the remainder of the Histoacryl/Lipiodol mixture into the varix.
6. Remove the Histoacryl/Lipiodol mixture syringe and replace this with the Lipiodol syringe
7. Inject the 1.5mL of Lipiodol to chase in residual glue, leave needle in varix for 15 seconds
8. Withdraw injection catheter/needle from varix leaving the needle exposed to avoid gluing the needle inside the catheter.
9. Flush 20mL of water into the stomach. This will set any glue in the stomach lumen.
10. If further injection is required, re-prime the needle with Lipiodol followed by the glue-lipiodol mixture as above and then repeat steps 4-9

Safe removal from stomach

11. Once injection complete and needle is flushed with water, retract needle into catheter ensuring that the needle is completely covered, and that the injection catheter sheath remains protruding at the end of the scope by about 2cm. This will prevent any glue on the catheter adhering to the scope.
12. Remove scope from stomach with catheter protruding from scope
13. Cut end of catheter near the proximal biopsy channel and remove catheter from distal end of scope after cutting off the needle portion for safety.

References:

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6. Seewald S, Sriram PV, Naga M *et al* Cyanoacrylate glue in gastric variceal bleeding. *Endoscopy* 34:926–932