

# Multiple pulmonary and systemic ectopic emboli following endoscopic injection sclerotherapy for gastric fundal varices

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## ABSTRACT

نستعرض في هذا المقال حالة سيدة عمرها ٤٠ عاماً وتعاني من تليف الكبد، وتورم خبيث بالكبد، ونزيف معدي علوي والتي أدت إلى انسدادات متعددة بالأوعية الدموية العامة والرئوية بعد حقن الأوعية المتسعة المعدية من خلال المنظار باستخدام المعالجة بالتصليب. ولم تعاني المريضة من أي أعراض في الجهاز التنفسي بعد الحقن. لقد أوضحت الأشعة الصدرية العادية والمقطعية وجود عتقات عقدية غير شفافة في الرئة وانسدادات متعددة داخل الشرايين العامة والرئوية مع عدم وجود تغيرات في نسيج الرئة، وبمتابعة المريضة بعد ٤ أشهر وجد أنه لم يحدث أي تغيير يُذكر في نتائج الأشعة.

We report a case of a 40-year-old female with cirrhosis, hepatocellular carcinoma, and upper gastrointestinal bleeding who developed multiple pulmonary emboli after endoscopic injection sclerotherapy for gastric variceal bleeding. The patient did not have any respiratory symptoms after the sclerotherapy. A chest radiograph obtained one day after the procedure for the evaluation of fever showed few small nodular radio-opacities in both hilar regions. Computed tomography (CT) demonstrates the existence of multiple radio-opaque emboli within the pulmonary and left common iliac arteries with no evidence of associated pulmonary parenchymal changes. She had no further symptoms, and the radiologic opacities persisted on CT obtained 4 months later.

*Saudi Med J 2012; Vol. 33 (3): 321-323*

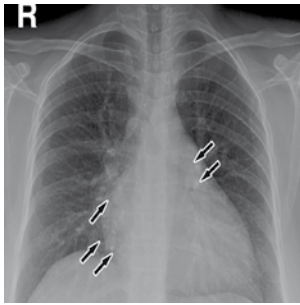
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Received 13th September 2011. Accepted 13th November 2011.

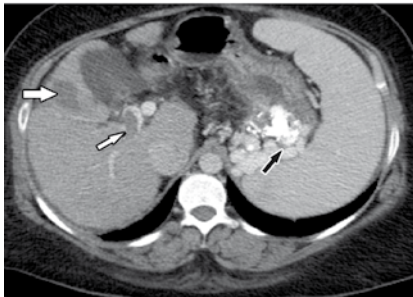
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Endoscopic injection sclerotherapy (EIS) for gastric variceal bleeding using n-butyl-2-cyanoacrylate (Histoacryl) began to be used in the mid-1980's. As Histoacryl is rapidly polymerized on contact with blood, the use of Histoacryl is the initial treatment of choice for gastric variceal bleeding.<sup>1</sup> Although Histoacryl is considered to be best suited for larger varices due to ease of intravariceal injection, it is more difficult to calculate the exact volume needed for variceal obliteration. The occurrence of systemic embolization with Histoacryl injections has been reported. Risk factors include the large volume injection and the existence of shunts between the portal system and the pulmonary vein.<sup>2</sup> This case represents a very rare complication of EIS with Histoacryl injection that shows both pulmonary as well as systemic multiple ectopic embolizations in a middle age Saudi lady. This case is presented to be added to the previously reported cases, and to draw attention to this rare complication.

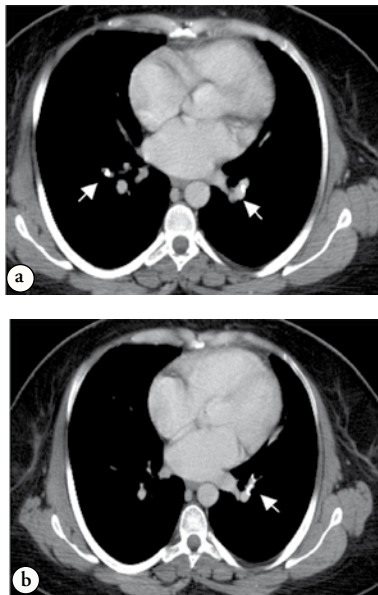
**Case report.** A 40-year-old Saudi lady with a known case of hepatitis B virus, cirrhotic liver, hepatocellular carcinoma (HCC), portal hypertension and gastric fundal varices with history of recurrent hematemesis and not on regular treatment was admitted electively for endoscopic sclerotherapy. Upper gastrointestinal endoscopy was carried out, and showed huge gastric fundal varices without active bleeding. Varices were injected with 6 ml of Histoacryl that is considered a large amount injected in the varices. There were no acute complications after the sclerotherapy, however, one day after the procedure, she got feverish, and chest radiograph was obtained, which showed few small nodular radio-opacities in both hilar regions (Figure 1). Computerized tomography (CT) of the abdomen was carried out after one week to evaluate the liver, which demonstrates the presence of HCC with partial thrombosis of the portal vein (Figure 2), also opacified gastric varices was noted (Figure 2), and the presence of multiple radio-opaque emboli in the pulmonary arteries



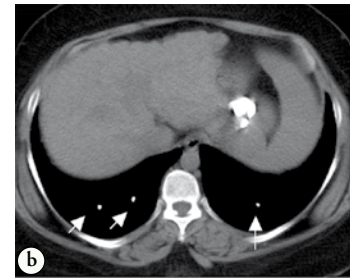
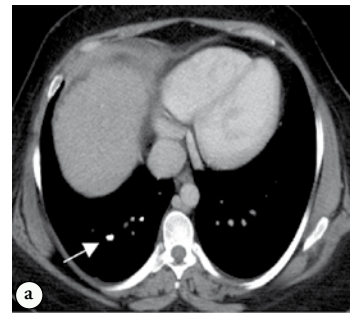
**Figure 1** - A chest radiograph of a 40-year-old woman with pulmonary embolism after endoscopic injection sclerotherapy, obtained one day after the procedure showed few small nodular radio-opacities in both sides (arrows).



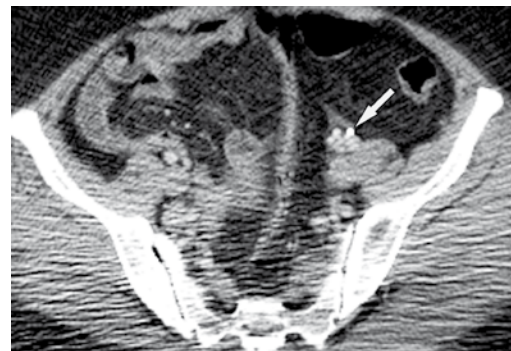
**Figure 2** - Abdominal CT scan obtained one week after endoscopic injection sclerotherapy demonstrates opacified gastric varices (black arrow), portal vein partial thrombosis (thin white arrow), and hepatocellular carcinoma (thick white arrow).



**Figure 3** - Chest CT scan mediastinal window (a & b) obtained one week after endoscopic injection sclerotherapy demonstrates bilateral nodular and tubular dense pulmonary emboli (white arrows).



**Figure 4** - Chest CT scan mediastinal window (a & b) demonstrates multiple segmental pulmonary emboli (white arrows) in both sides with no associated parenchymal abnormality.



**Figure 5** - Abdominal CT scan demonstrates radio-opaque embolus in the left common iliac artery (white arrow) representing systemic embolization due to collaterals.

(Figures 3 a&b and Figures 4 a&b) and left iliac vessels (Figure 5) was also noted.

**Discussion.** In patients with portal hypertension, acute gastroesophageal variceal bleeding is one of the main causes of death. Therefore, the treatment and prevention of variceal bleeding are important for successful patient management.<sup>3</sup> For this reason, the demand for palliative treatment of acute gastroesophageal variceal bleeding continually increases. Various treatment modalities, such as pharmacological therapy, balloon tamponade, EIS, and endoscopic variceal ligation have all been used for this purpose. The EIS with Histoacryl is the initial

treatment of choice for gastric variceal bleeding,<sup>4</sup> and is being increasingly used for emergent control of acute bleeding.<sup>5</sup> Dysphagia, sepsis, and fever are reported rare complications after EIS. Occasionally, other serious complications such as embolization to the brain portal vein, and lung<sup>6</sup> have been reported. However, the incidence of Histoacryl pulmonary embolism (PE) following EIS is unclear, owing to the small number of reported cases, and the reported severity has varied from asymptomatic to fatal.<sup>7</sup> Although Histoacryl is considered to be best suited for larger varices due to ease of intravariceal injection, it is more difficult to assess the precise volume needed for variceal obliteration. As the occurrence of extra variceal embolization may be related to excess Histoacryl, the dosage used for injection is usually determined in a conservative manner that tended to result in incomplete variceal obstruction.

Inaccurate intravariceal injection may also occur when difficult endoscopic conditions result in extravasation of Histoacryl (either paravariceal or through leakage). With accurate intravariceal injection, the Histoacryl cast will fill out the variceal channel appropriately, and not just compress it. Injection is more likely to be intravariceal if there is less active bleeding, and a clear visual field. The adequacy of variceal obliteration can be judged from the shape of the Histoacryl-Lipiodol cast on a radiograph, or simply by endoscopic palpation with a blunt probe.<sup>8</sup> Risk factors of the occurrence of systemic embolization with Histoacryl injections include a large volume injection, and the existence of shunts between the portal system and the pulmonary vein.<sup>9</sup> During EIS for gastric varices, an excessive amount of Histoacryl may be embolized into the systemic circulation via collateral venous channels, such as the gastrorenal-splenorenal veins, which are directly connected to the gastric varices.<sup>10</sup> Rapid injection has been mentioned as a risk factor, as it may cause increased intravariceal pressure and induce migration of the Histoacryl before full polymerization.<sup>9</sup> Pulmonary emboli appeared as tubular and nodular shadows of varying sizes in chest radiography and CT scans. Despite the absence of a predominant location of the pulmonary emboli on chest radiographs, the larger emboli are invariably located in the pulmonary hilar region. This may reveal preferential involvement of the main or lobar pulmonary arteries. The density of the emboli appeared greater than blood, but less than calcium.<sup>11</sup> Tiny pulmonary emboli may be subtle or not visualized on chest radiography or CT scans owing to their overlap with underlying pulmonary vascular shadows on chest radiography, or to volume averaging in CT.<sup>12</sup>

In conclusion, radiographically evident n-butyl-2-cyanoacrylate PEs following EIS appeared as linear or rounded radiopacities on chest radiography and CT. The PEs appear to be more common in patients receiving a higher volume of liquid acrylate during the procedure. Affected patients are usually asymptomatic or mildly symptomatic, and there are no direct fatalities of this complication.

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