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RESEARCH ARTICLE

PULMONARY EMBOLISM OF BUTYL-CYANOACRYLATE AFTER ENDOSCOPIC SCLEROSIS OF GASTRIC VARICES

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Abstract

Pulmonary embolic complications may occur during endoscopic treatment of gastric varices using butyl-cyanoacrylate glue. Combined with a contrast agent, in particular Lipiodol, these vascular embols can only be diagnosed by computed tomography without injection of iodinated contrast. We report the case of a 21-year-old patient who presented with bilateral pulmonary embolism due to the injection of this glue into gastric varices.

Introduction:-

The sclerosis or the obturation of gastric varicose veins with butyl-cyanoacrylate diluted with Lipiodol is currently the curative but also the preventive treatment of choice for digestive bleeding by rupture of gastric varices [1]. However, this technique is associated with various complications, the rarest and most serious are embolic accidents [2] with a fatal outcome in some cases [3].

We report a case of bilateral pulmonary embolism related to the obturation of gastric varices with butyl-cyanoacrylate.

Case Report:

A 21-years old patient, with no particular pathological history or toxic habits, is followed in the Gastrology department for hepatic cirrhosis, and presents gastric varices for which sclerosis by butyl-cyanoacrylate glue, for preventive purposes, has been indicated and carried out.

Just after the endoscopic procedure, the patient suddenly complained of chest pain associated dyspnea such as polypnea. The blood oxygen saturation was 89% without oxygen therapy, and the pulmonary examination showed diffuse sub-crackling rales in both lung fields.

A chest computed tomography without injection of iodinated contrast was performed urgently, objectifying the presence of bilateral pulmonary opacities of metal density, of intravascular distribution, occupying the lumen of the right lower lobe artery and bilateral segmental and subsegmental arteries **(Fig. 1)**.

In view of the context, the diagnosis of pulmonary embolism due to the migration of the butyl-cyanoacrylate / Lipiodol mixture was then retained. The patient was put on oxygen therapy with favorable outcome.

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A control chest CT scan carried out 10 days later revealed the persistence of the same images of pulmonary embolism **(Fig. 2)** with the appearance of bilateral postero-basal pulmonary infarcts **(Fig. 3)**. A third CT scan done 30 days after showed the persistence of the same aspect of the pulmonary embolism **(Fig. 4)** with regression in size of the pulmonary infarct foci **(Fig. 5)**.

The patient had become asymptomatic.

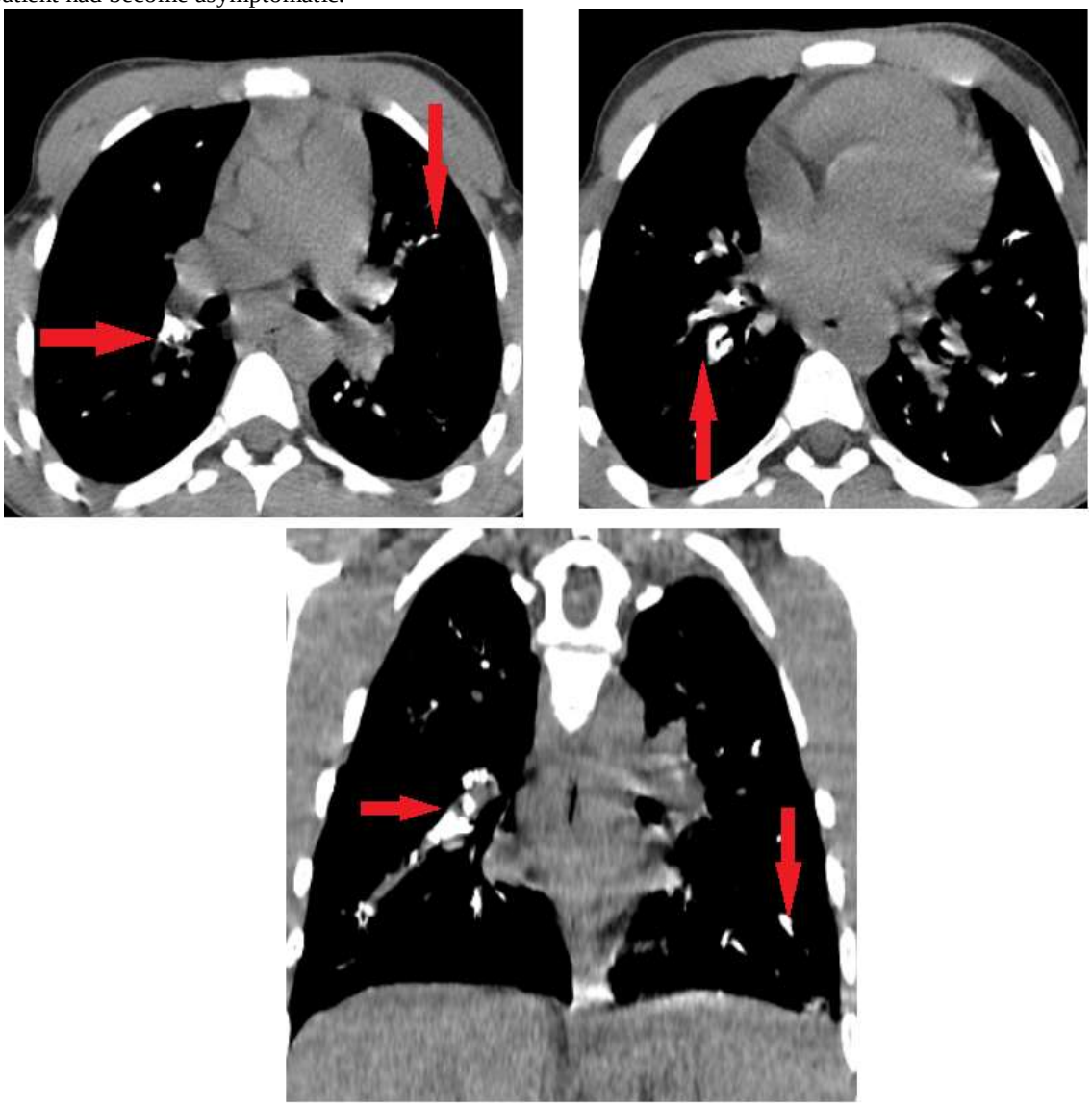

Figure 1:- Initial chest CT scan showing spontaneously hyperdense areas of intravascular distribution, in the two pulmonary fields due to the migration of the butyl-cyanoacrylate/lipiodol glue, responsible for pulmonary embolism.

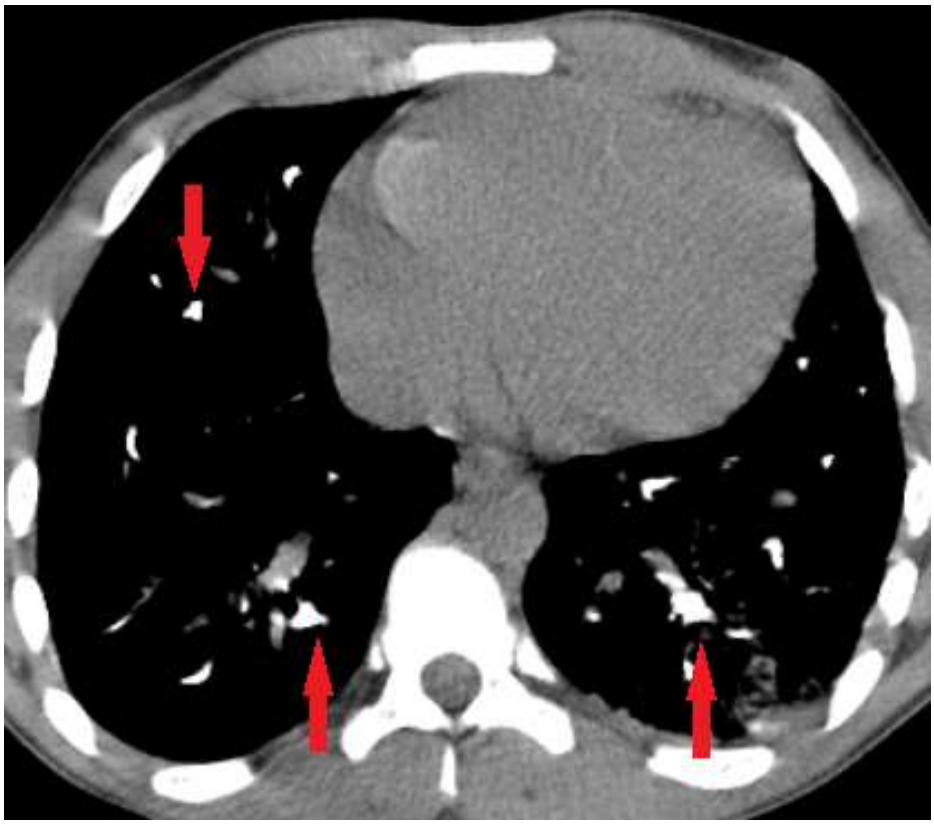

Figure 2:- Chest CT scan at D10 objectifying the persistence of spontaneously hyperdense areas.

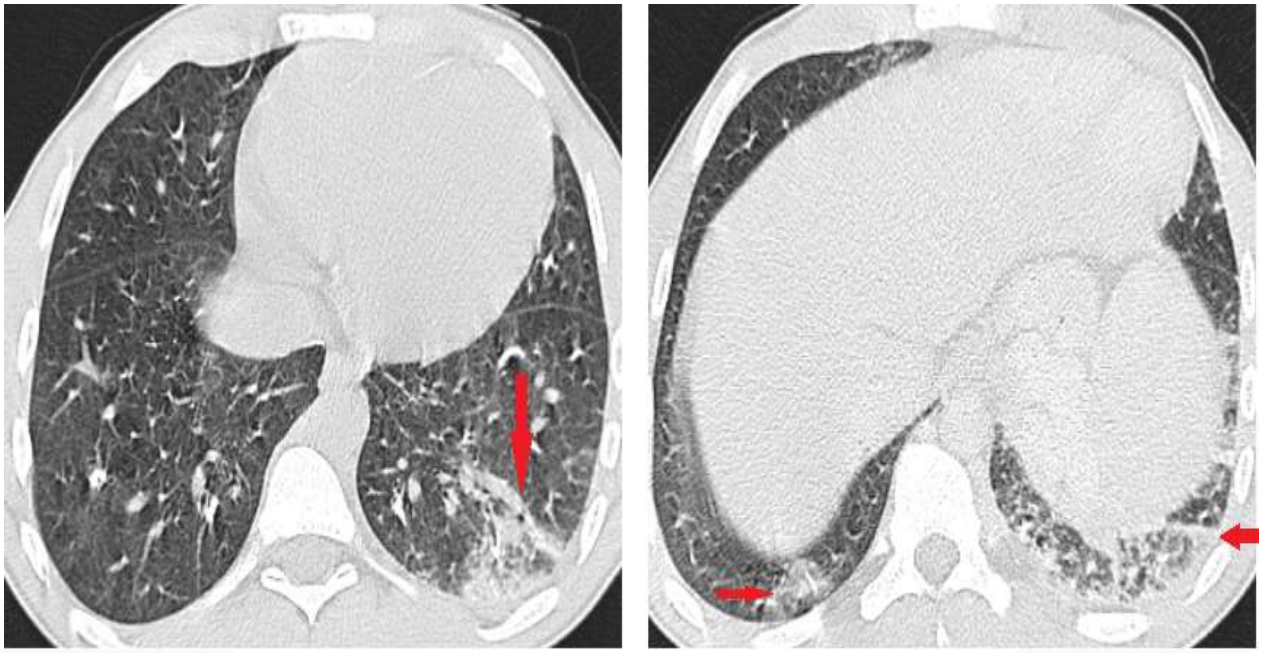

Figure 3:- Chest CT scan at D10 showing bilateral pulmonary infarction.

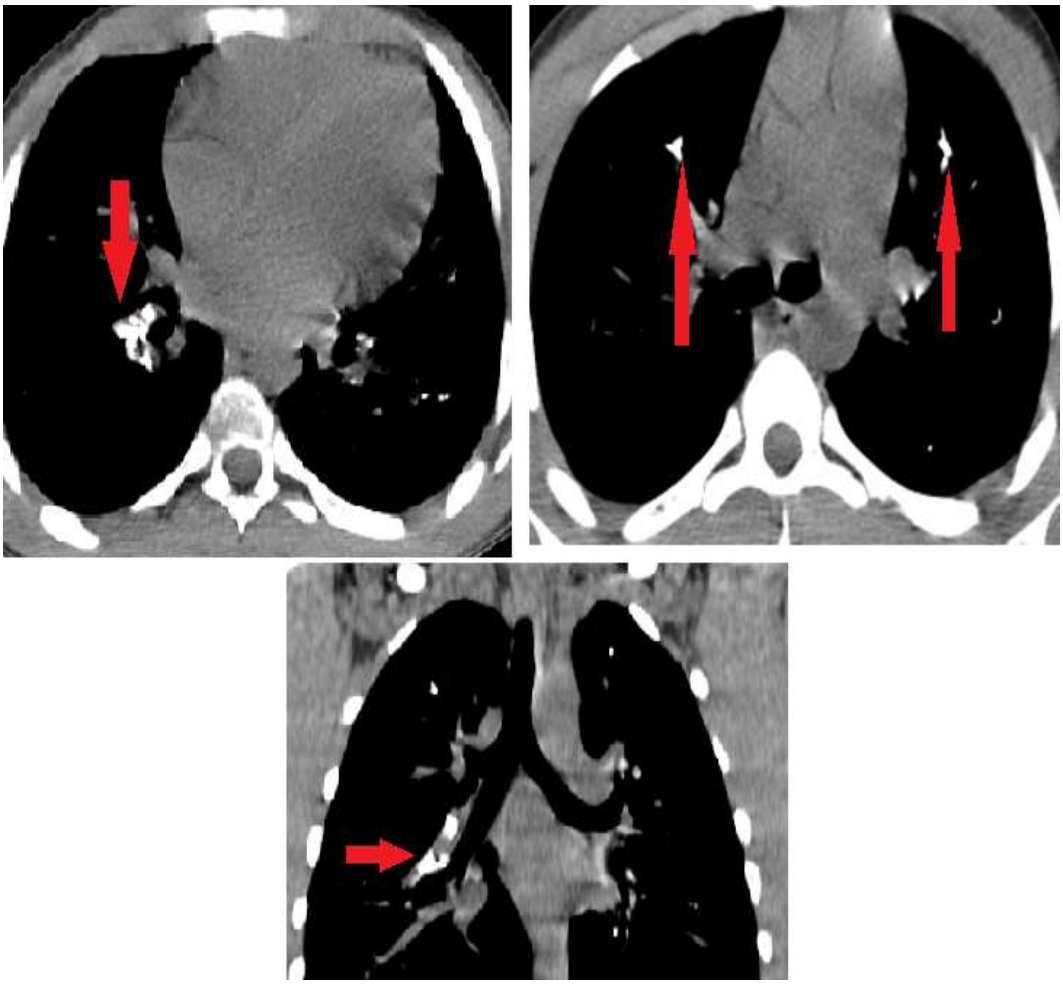

Figure 4:- Chest CT scan at D30 objectifying the persistence of spontaneously hyperdense areas.

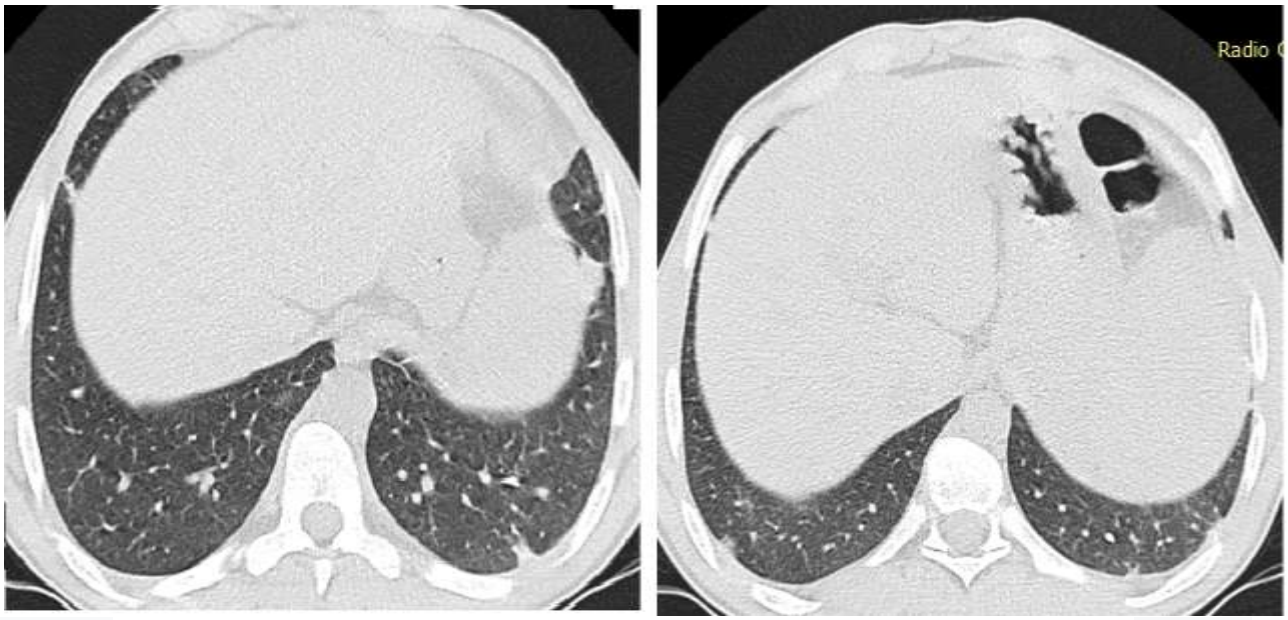

Figure 5:- Chest CT scan at D30 showing the regression in size of bilateral pulmonary infarcts.

Discussion:-

Gastric varicose veins' sclerosis using butyl-cyanoacrylate is currently considered as the treatment of choice, whether for curative or preventive purposes. The product used, butyl-cyanoacrylate, is a liquid tissue glue, which polymerizes and solidifies in a few seconds on contact with ionic charges in the blood [4]. This product is combined with a contrast agent such as Lipiodol, to opacify the injected varicose vein in order to check the site of the injection by radiography and any migration of glue fragments into the systemic circulation, mainly portal or pulmonary.

Several complications are possible: hyperthermia, hemorrhagic recurrence by expulsion of the glue, cerebrovascular accidents and pulmonary embolism [5].

One of the rare complications is bilateral pulmonary embolism. It is due to a relatively large passage of the injected product in the venous circulation, then in the right cardiac chambers, whereas normally, butyl-cyanoacrylate causes immediate localized vascular obturation. The increased volume associated with the use of lipiodal solution increases the risk of delayed polymerization and thus increases the risk of pulmonary embolization [6]. The size of the gastric varices being treated also contribute to the risk of embolisation; in particular, large-sized varices with high blood flow rates frequently associated with gastrorenal shunts have a higher risk of pulmonary embolism [7].

The radiological and computed tomography presentation is characteristic and leads to the diagnosis of pulmonary embolism. Unlike cruoric pulmonary embolism, the CT scan must be done without injection of iodinated contrast, because « lipiodolated » vascular embols are of high spontaneous density. We visualize the presence of multiple opacities of metallic density, disseminated throughout the pulmonary arterial tree.

Long-term radiological follow-up can show a favorable spontaneous evolution, with a significant decrease in number and density of the micronodular images on the successive images. According to some authors, this actually corresponds to the gradual natural elimination of lipiodol, giving way to pulmonary embols of butyl-cyanoacrylate which are not metabolizable and non-radiopaque [8].

The management of a patient with symptomatic pulmonary embolism of butyl-cyanoacrylate glue is uncertain. Anticoagulant therapy is not logically indicated but can sometimes be discussed. Oxygen therapy and symptomatic anti-inflammatory and analgesic treatment may be suggested with hemodynamic and gas monitoring in the intensive care unit if necessary.

Finally, to prevent the systemic passage of the cyanoacrylate-lipiodol mixture, some authors recommend to modify the composition of the glue by varying the ratio of lipiodol to cyanoacrylate. Some autors found that diluting the cyanoacrylate solution to less than 40% increased the likelihood of such migration [9]. Special attention should also be paid to large caliber and fast-flowing varicose veins that require a larger volume of solution. [7].

Conclusion:-

The diagnosis of pulmonary embolism by migration of the butyl-cyanoacrylate / Lipiodol mixture is easy and typical in imaging. While injection of this mixture remains the gold standard treatment for ruptured gastric varicose veins, special care must be taken to prevent the risk, sometimes fatal, of pulmonary embolism.

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