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Case Report / Приказ случаја

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Partial resection of the splenic cyst using Radiofrequency ablation system

Парцијална ресекција слезине коришћењем радиофреквентног аблационог система

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SUMMARY

Introduction This paper presents a case of a patient with a benign splenic cyst, which was removed by way of partial resection of the spleen.

Case Outline The patient's benign cyst in the lower pole of the spleen was excised using single cool-tip™ Radiofrequency ablation electrode (Cool-tip RF Ablation System, Covidien, USA®). More than half of the spleen was excised without setting stitches to the splenic parenchyma and without any other hemostyptics. This way, the function of the spleen was preserved, which was proven with scintigraphy and computed tomography two years after the intervention.

Conclusion The Radiofrequency ablation system with internally cooled needles can be used successfully and without any consequences to the organ, especially in case of large benign splenic cysts, when it is necessary to preserve the function of the spleen.

Keywords: spleen, partial splenectomy, Radiofrequency ablation

САЖЕТАК

Увод Циљ рада је да прикаже болесницу са бенигном цистом слезине која је уклоњена парцијалном ресекцијом слезине.

Приказ случаја Код болеснице са бенигном цистом доњег пола слезине помоћу једне cool-tip™ електроде за радиофреквентну аблацију (Cool-tip RF Ablation System, Covidien, USA®) одстрањено је више од половине слезине без постављања шавова на паренхим слезине и коришћења других хемостатских метода. На овај начин презервирана је функција слезине која је доказана сцинтиграфски и компјутеризованом томографијом две године након интервенције.

Закључак Употреба радиофреквентног аблационог система са интерно хлађеним иглама може се применити успешно и без последица по орган код великих бенигних циста слезине.

Кључне речи: слезина, парцијална спленектомија, радиофреквентна аблација

INTRODUCTION

Preservation of the spleen and its function is paramount for resistance to infections and prevention of overwhelming post-splenectomy infection [1,2]. Spleen preservation is imperative in all the cases of spleen surgery that allow it. This includes traumas and other pathomorphologies of the spleen, namely tumours, metastatic changes, and hypersplenism [3-5]. Splenic cysts occur in approximately 0, 07% of the cases and are usually asymptomatic until their growth starts putting pressure on the surrounding organs [6,7]. They are usually benign, but cysts of other etiologies must be excluded before the surgery. This primarily means hydatid cysts. In case of elective surgery of benign cysts, one must preserve the function of the spleen and attempt partial resection. Partial resection of the spleen is carried out using various surgical techniques [8,9]. As of 2003, it is possible to use Radiofrequency (RF) ablation system in the so called bloodless partial splenectomy [10].

CASE REPORT

A 34-year-old white woman reported to the doctor due to vague symptomatology in the upper abdomen. The ultrasound (US) and computed tomography (CT) of the abdomen revealed a large 10.5cm cyst in the lower pole of the spleen, covering 50% of the organ (Figure 1). Elective surgery was proposed to the patient. During the preoperative treatment, the patient was tested for carcinoembryonic antigen (CEA) and carbohydrate antigen (CA 19-9) tumour markers. Hydatid disease was excluded with the serological test. During the preoperative treatment, the patient received antibiotic prophylaxis and low-molecular-weight heparin.

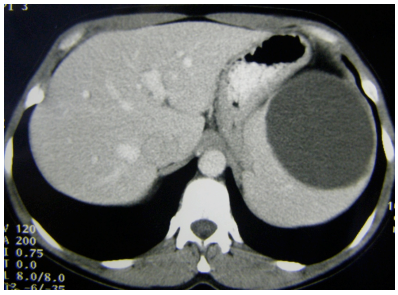

Figure 1. Preoperative computed tomography with cyst in spleen.

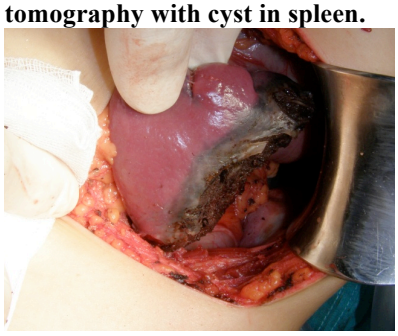

Figure 2. Spleen surface after radiofrequency ablation.

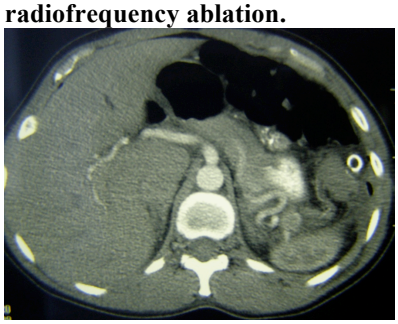

Figure 3. Computed tomography two days after the operation.

Figure 4a. Spleen scintigraphy.

Figure 4b. CT two years after the operation.

The upper abdomen is accessed by way of left-side paracostal laparotomy. The spleen is mobilized toward the midline, by cutting the splenophrenic and splenocolic ligaments. After exposing the entire organ without clamping arterial or venous blood vessels, a series of ablation-induced coagulation necroses are made on the splenic parenchyma by a single cool-tip™ Radiofrequency Ablation electrode (Cool-tip RF Ablation System, Covidien, USA®), which is then cut with a knife, without placing a single stitch to the remaining splenic parenchyma (Figure 2). This method ensures resection of the entire lower pole of the spleen that contains the cyst. A drainage tube is positioned in the subphrenic space, and the operative wound is closed by anatomic layers. There were no complications, namely bleeding, neither during nor after the intervention. A follow-up CT scan was performed two days after the operation in order to observe the blood vessels and ascertain the vitality of the splenic tissue (Figure 3).

On the fourth operative day, the drainage tube was removed and the patient discharged with normal vital parameters and on oral nutrition. Spleen scintigraphy with labelled red blood cells was performed one month after the intervention and revealed preserved function of the somewhat smaller spleen (Figure 4a). Computed tomography two years after the operation also showed normal findings (Figure 4b). The operation was performed at the Clinic for Thoracic Surgery, Institute for Lung Disease in Sremska Kamenica.

DISCUSSION

Surgical techniques for preserving the function of the spleen were developed during the 1980s and 1990s [11,12,13]. These were particularly significant for pediatric traumas, when non-operative treatment was recommended in case of blunt traumas in children, and later in adults as well [14,15]. These techniques always implied the mobilization of the spleen and selective ligating of arterial blood vessels, as well as the use of absorbable sutures or specially designed nets made of the same absorbable material [16,17,18]. Radiofrequency ablation and its use in spleen surgery have been known since Habib's first reports in 2003 [10]. This technique has been widely used in liver surgery

[19]. A series of coagulation necroses induced on the splenic parenchyma results in a completely avascular resection surface after cutting the splenic tissue. This is achieved with internally cooled needles with ablation sphere of approximately 3cm. The application of RF ablation system on one part of the splenic parenchyma does not damage the function of the remaining part of the spleen after a partial resection, which was proven with scintigraphy. In particular, this technology could be implemented during laparoscopic partial resection of benign splenic cysts, provided safe access is ensured for the electrode through the anterior or anterolateral abdominal wall. We believe that this is possible, since the internally cooled needle remains cool during the emission of RF waves.

The use of RF ablation system with internally cooled needles can be used successfully and without any consequences to the organ, especially in case of large benign splenic cysts, when it is necessary to preserve the function of the spleen.

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