



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Subtotal splenectomy preserving the inferior splenic pole for the treatment of Hodgkin's lymphoma



Andy Petroianu*

Department of Surgery of the Medical School of the Federal University of Minas Gerais, Brazil

ARTICLE INFO

Article history:

Received 20 January 2017
 Received in revised form 12 April 2017
 Accepted 12 April 2017
 Available online 25 April 2017

Keywords:

Hodgkin's lymphoma
 Inferior splenic pole
 Superior splenectomy
 Partial splenectomy
 Splenectomy
 Treatment
 Follow-up

ABSTRACT

INTRODUCTION: Splenectomy is helpful in the management of selected patients with Hodgkin's lymphoma (HL), but in some cases this procedure is accompanied by a greater morbidity and mortality mainly due to sepsis. This is the first published case of subtotal splenectomy preserving the inferior splenic pole without the maintenance of the splenic vascular pedicle.

PRESENTATION OF CASE: A 53-year-old man with HL refractory to chemo and radiotherapy associated to a very large spleen was successfully treated with subtotal splenectomy, preserving the inferior splenic pole supplied only by the left gastroepiploic and inferior splenic pole vessels. After an eleven year uneventful postoperative follow-up, the dimensions and function of the spleen are still preserved, and the disease is under control with chemo- and radiotherapy.

CONCLUSION: Subtotal splenectomy is efficacious to preserve the splenic functions and to prevent adverse effects of a large spleen on the treatment of Hodgkin's lymphoma confined to superior pole and producing significant abdominal symptoms and hematological effects.

© 2017 The Author(s). Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Since 1984, in an attempt to maintain at least part of the splenic function when the removal of the spleen is recommended, we have performed subtotal splenectomies, preserving the superior splenic pole supplied by the splenogastric vessels. This procedure was successfully used for the treatment of 130 patients with portal hypertension, 93 patients with severe splenic trauma, 18 patients with myeloid metaplasia, nine patients with Gaucher's disease, five patients with retarded growth and sexual development associated with splenomegaly, five patients with chronic lymphocytic leukemia, three patients with severe splenic pain due to intra-parenchymal thrombosis, one patient with splenic hemangioma, one patient with splenic abscess, and one patient with a cystadenoma of the pancreatic tail [1–15].

Splenectomy has a very limited role in the treatment of Hodgkin's lymphoma (HL) and is recommended only to control HL activity that does not respond to chemo- and radiotherapy [16,17]. Since the purpose of a splenectomy is not to make the patient asplenic, a partial splenectomy may achieve the objectives without the adverse side effects of the total removal of the spleen [18–20]. This is the first report of subtotal splenectomy preserving the infe-

rior splenic pole without the maintenance of the splenic vascular pedicle.

2. Presentation of case

The treatment performed on this patient was approved by the Ethical Committee of the Federal University of Minas Gerais under the Protocol nr. CAAE 03990.203.000-11 and has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. The patient had consent the publication of this case report. This work has been reported in line with the SCARE criteria [21].

A 53-year-old white man with HL was submitted to chemotherapy and radiotherapy at Hospital of Clinics of the Federal University of Minas Gerais, Brazil and referred to the Department of Surgery for splenectomy. The indications for spleen removal were abdominal and breathing discomfort caused by a huge spleen due to HL refractory to adjuvant oncologic therapy. To avoid surgical induced asplenic immune depression, a subtotal splenectomy was recommended.

The abdominal cavity was entered through a left transverse laparotomy; the splenic artery was tied in the retrogastric space. At laparotomy, a very large spleen with a tumor restricted to the superior pole was found (Fig. 1A). The spleen was displaced upward, and its ligaments were sectioned. The superior splenic vessels, including the splenogastric vessels, the superior splenic pole vessels and the splenic hilum were tied and cut. Care was taken to preserve the left gastroepiploic and the inferior splenic pole vessels to maintain

* Correspondence to: Avenida Afonso Pena, 1626 – apto. 1901, Belo Horizonte, MG 30130-005, Brazil.
 E-mail address: petroian@gmail.com

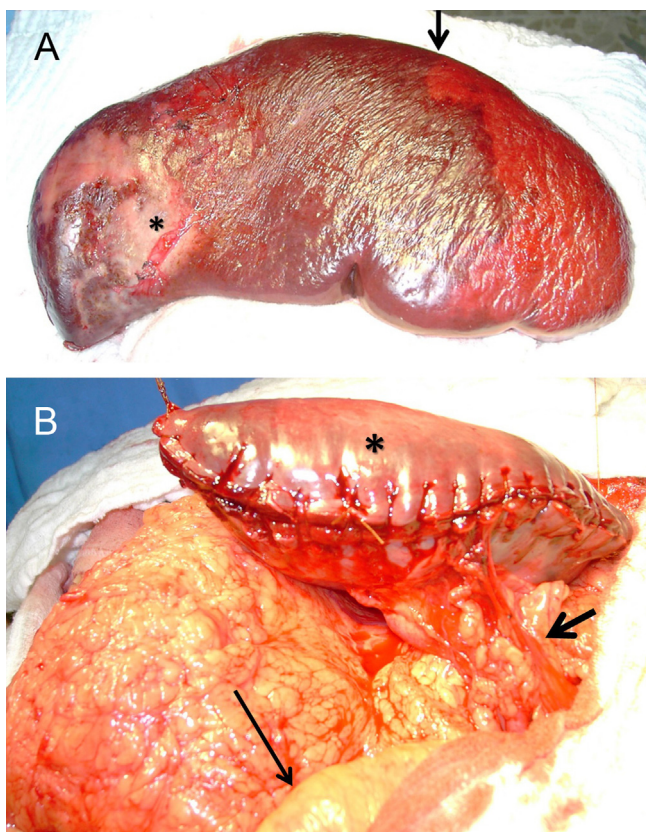


Fig. 1. Surgical view of subtotal splenectomy for treatment of a man with Hodgkin's lymphoma.

A– The very large spleen mobilized within the surgical field after the section of the splenic ligaments. Observe the tumor in the superior pole (*) and the transition (arrow) between the inferior pole (red) supplied by the left gastroepiploic and inferior pole vessels and the rest of the devascularized spleen (dark color).

B – The inferior splenic pole (*) after subtotal splenectomy. Observe the left gastroepiploic vessels (long thin arrow) inside the grater omentum, and the inferior pole vessels (short thick arrow).

the vitality of the inferior splenic pole. The spleen was cut at the dividing line between the normal color of the inferior portion of the organ and the darker colored superior portion (Fig. 1A). Two wide flaps (anterior and posterior) of the 5 splenic capsule were retained. The bleeding large vessels of parenchyma were sutured with 4-0 chromic catgut. A continuous 3-0 chromic catgut suture closed the two flaps of the splenic capsule (Fig. 1B). The inferior pole was returned to its normal position and sutured to the diaphragm with one stitch using 2-0 chromic catgut. The blood loss was minimal and no blood transfusion was necessary. The removed spleen weighed 2300 g.

Histopathological analyses of the spleen confirmed the HL restricted to the superior pole with wide margins free of tumor. The patient had uneventful postoperative recovery and was discharged from the hospital on the fifth postoperative day. During the eleven-year follow-up the patient presented no severe infection, and the lymphoma was adequately controlled. Scintigraphic images of the splenic remnant were positive in all postoperative exams, confirming the splenic vitality and the phagocytic function. The dimensions of the splenic remnant, according to CT exams, remained unchanged during the follow-up period (Table 1).

3. Discussion

Chemo- and radiotherapy are the usual treatments of HL, and most of patients survive many years under control [16,17]. How-

Table 1
Hematological exams one week before and three months after subtotal splenectomy to treat Hodgkin's lymphoma.

Exams	Preoperative	Postoperative
Red Blood Cells	$3.2 \times 10^{12}/L$	$5.0 \times 10^{12}/L$
Hemoglobin	108 g/L	141 g/L
Hematocrit	36.0%	42.5%
White Blood Cells		
Total	$3.6 \times 10^9/L$	$12.4 \times 10^9/L$
Neutrophils	61%	78%
Lymphocytes	31%	17%
Eosinophils	1%	0%
Basophils	1%	0%
Monocytes	6%	5%
Platelets	$78 \times 10^9/L$	$478 \times 10^9/L$

ever, the huge growth of the spleen, which may occur in some patients, leads to abdominal discomfort and therapeutic resistance. It is well-known that total splenectomy reduces the immune defenses and may be followed by severe sepsis associated with precocious and sudden deaths. This complication is more frequent in previously immune suppressed patients, such as those with lymphomas [19,20]. Chemo- and radiotherapy worsen organic defenses and enhance mortality. Since the total removal of the spleen is not necessary to treat HL, partial splenectomy should be enough to reduce the influence of splenic growth on both the symptoms and the hematologic system [18,19]. However, the early good results are transitory, given that the spleen may regrow due to the blood flow through the splenic vascular pedicle [20]. To avoid this inconvenient follow-up, we have proposed the subtotal splenectomy, which preserves a pole of the spleen without the vascular pedicle.

Usually, the subtotal splenectomy maintains only the superior pole supplied by the splenogastric vessels, but in this case, the tumor was located in the superior pole and had to be removed. Therefore, we decided to perform the subtotal splenectomy, preserving the inferior splenic pole supplied by the left gastroepiploic vessels. Prior to the present case report, the use of this technique had never been published. Thus, we decided to follow the patient a least for ten years before publishing the case to detect all complications of this procedure when in the presence of HL. Its main advantage is to preserve the splenic functions in a normal size spleen without the risk of its regrowth and resistance to oncologic treatment.

As limitation of this study, the lower number of patients with HL confined to a single pole must be emphasized. This procedure should not be attempted for staging purpose in HL because the disease may be present in the preserved spleen even without its macroscopic evidence. Further studies are needed to confirm the efficacy of this procedure in other case.

4. Conclusion

A subtotal splenectomy that preserves the inferior splenic pole is efficacious in maintaining splenic functions and preventing the adverse effects of a large spleen in the treatment of Hodgkin's lymphoma confined to superior pole and producing significant abdominal symptoms and hematological effects.

Conflict of interest

The author of this paper has no conflict of interest to declare.

Funding sources

None.

Ethical approval

The treatment performed on this patient was approved by the Ethical Committee of the Federal University of Minas Gerais under the Protocol nr. CAAE 03990.203.000-11. Informed consent was obtained from the patient in written for the surgical procedure and for publication of his case with picture of the splenic procedure.

Consent

Informed consent was obtained from the patient in written for the surgical procedure and for publication of his case with picture of the splenic procedure

Authors contribution

Revision of the literature, proposal of the surgical procedure, surgeon who performed the procedure, surgeon responsible for the patient during the perioperative period and all the follow-up, author who wrote the manuscript.

Guarantor

I accept full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

Acknowledgements

The author thanks the National Council of Science and Technology (CNPq), the Research Aid Foundation of Minas Gerais (FAPEMIG) and the Rectorship of Research of the Federal University of Minas Gerais (PRPq) for the financial support.

References

- [1] A. Petroianu, Treatment of portal hypertension by subtotal splenectomy and central splenorenal shunt, *Postgrad. Med. J.* 64 (1988) 38–41.
- [2] A. Petroianu, Subtotal splenectomy and portal-variceal disconnection in the treatment of portal hypertension, *Can. J. Surg.* 36 (1993) 251–254.
- [3] A. Petroianu, A.E. Oliveira, L.R. Alberti, Hypersplenism in schistosomatic portal hypertension, *Arch. Med. Res.* 36 (2005) 496–501.
- [4] J.B.N. Rezende, A. Petroianu, S.K. Santana, Subtotal splenectomy and central splenorenal shunt for treatment of bleeding from Roux en Y jejunal loop varices secondary to portal hypertension, *Dig. Dis. Sci.* 53 (2008) 539–543.
- [5] V. Resende, A. Petroianu, Subtotal splenectomy in severe trauma of the spleen, *J. Trauma* 44 (1998) 933–935.
- [6] V. Resende, A. Petroianu, Functions of the splenic remnant after subtotal splenectomy for treatment of severe splenic injuries, *Am. J. Surg.* 185 (2003) 311–315.
- [7] A. Petroianu, Subtotal splenectomy for treatment of patients with myelofibrosis and myeloid metaplasia, *Int. Surg.* 81 (1996) 177–179.
- [8] A. Petroianu, Subtotal splenectomy in Gaucher's disease, *Eur. J. Surg.* 162 (1996) 511–513.
- [9] A. Petroianu, Subtotal splenectomy for treatment of retarded growth and sexual development associated with splenomegaly, *Minerva Chir.* 58 (2003) 413–414.
- [10] A. Petroianu, Subtotal splenectomy for the treatment of chronic lymphocytic leukemia, *Ann. Hematol.* 82 (2003) 708–709.
- [11] A. Petroianu, A.M. Murad, New research on treatment of chronic lymphocytic leukemia, *Adv. Hematol. Res.* 2 (2007) 21–34.
- [12] A. Petroianu, R.N. Berindoague, Laparoscopic subtotal splenectomy, *Minerva Chir.* 59 (2004) 501–505.
- [13] A. Petroianu, C.T. Brandt, L.F. Alencar, Partial splenectomy for treatment of splenic hemangioma, *Chirurgia (Bucur)* 104 (2009) 487–490.
- [14] R.G. Nagem, A. Petroianu, Subtotal splenectomy for splenic abscess, *Can. J. Surg.* 52 (2009) E91–E92.
- [15] A. Petroianu, Treatment of cystadenoma of the pancreatic tail by distal pancreatectomy and subtotal splenectomy, *Dig. Surg.* 12 (1995) 259–261.
- [16] G.U. Adiga, L. Abebe, P.H. Wiernik, Partially successful treatment of a patient with chronic lymphocytic leukemia and Hodgkin's disease, *Am. J. Hematol.* 72 (2003) 267–273.
- [17] H.C. Fung, A.P. Nademane, Approach to Hodgkin's lymphoma in the new millennium, *Hematol. Oncol.* 20 (2002) 1–15.
- [18] H.J. Hoekstra, R.Y. Tamminga, W. Timens, Partial splenectomy in children: an alternative for splenectomy in the pathological staging of Hodgkin's disease, *Ann. Surg. Oncol.* 1 (1994) 480–486.
- [19] G.O. Strauch, Partial splenectomy in staging for Hodgkin's disease, *N. Engl. J. Med.* 299 (1978) 1252.
- [20] J.M. Slaiby, J.P. Crowley, J.F. Amaral, Late recurrence of Hodgkin's disease after partial splenectomy, *J. Pediatr. Surg.* 31 (1996) 731–732.
- [21] R.A. Agha, A.J. Fowler, A. Saetta, I. Barai, S. Rajmohan, D.P. Orgill, The SCARE statement: consensus-based surgical case report guidelines, *Int. J. Surg.* 34 (2016) 180–186.

Open Access

This article is published Open Access at [sciencedirect.com](https://www.sciencedirect.com). It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.