

# Rupture Splenic Artery Aneurysm In Pregnancy

S Gourgiotis, P Alfaras

## Citation

S Gourgiotis, P Alfaras. *Rupture Splenic Artery Aneurysm In Pregnancy*. The Internet Journal of Emergency Medicine. 2005 Volume 3 Number 1.

## Abstract

True aneurysm of the splenic artery is rare. One case of ruptured true splenic artery aneurysm in pregnancy is presented. We discuss the case of a 29 years old pregnant woman who was admitted in a state of shock in the Accidents & Emergencies in our hospital. She had haemoperitoneum and was subjected to exploratory laparotomy. Aneurysmectomy was performed in addition to splenectomy. The postoperative course was uneventful but the fetus was dead.

## INTRODUCTION

Splenic artery aneurysms (SAA) are rare clinical entities that carry the risk of rupture and fatal haemorrhage. Ruptured SAA especially during pregnancy is an event with fateful consequences for mother or fetus or both.

Atherosclerosis and congenital defects of the arterial wall has been described as the major causes of SAA.<sup>1</sup> Preliminary weakness of the arterial wall with concomitant increase in blood pressure is considered to promote aneurysm formation.<sup>2</sup> Liver diseases with splenomegaly, repeated pregnancies, systemic hypertension and old age are certain clinical settings with a high incidence of SAA. They are more frequent in women than men (4: 1) and more frequent in pregnancy specifically at the third quarter.

The patients usually present without symptoms or with pain in the epigastrium. There is an increased risk of rupture if the aneurysm is more than two centimetres in diameter. Initially the bleeding remains confined in the lesser sac, followed 6-96 hours later by free intraperitoneal haemorrhage and collapse. The initial phase where haemorrhage remains confined to the lesser sac may provide vital time for diagnosis and preparation for intervention. However in pregnancy the bleeding remains confined rupture to the peritoneal cavity and the development of the symptoms is rapid. The treatment of ruptured SAA is the aneurysmectomy in addition or not to splenectomy.

## CASE REPORT

A 29-years-old female, in the 34th week of pregnancy, presented with pain in the epigastrium and left hypochondrium in the Accidents & Emergencies.

There was no other symptom or past history of pain. On examination the patient was pale with a rapid thread pulse (160 pulses per minute), systolic blood pressure of 60 mm Hg, diastolic blood pressure of 30 mm Hg and cold and clammy extremities. Abdomen was distended and diagnostic peritoneal tap revealed haemoperitoneum. Exploratory laparotomy was carried out after haemodynamically stabilising the patient. There were one and a half litres of blood in the free peritoneal cavity and the lesser sac was full of blood. On opening the lesser sac and evacuating the haematoma, the source of bleeding was identified as the proximal end of a ruptured splenic artery aneurysm involving the distal third portion. Proximal ligation with aneurysmectomy and splenectomy was carried out. Unfortunately the fetus was dead. The postoperative course was uneventful and the patient was discharged on the 9th postoperative day. She continued to do well nine months later.

## DISCUSSION

Splenic artery aneurysms (SAA) are the most common type of aneurysms found in the splanchnic arterial bed and are second in frequency only to aortic and iliac artery aneurysms among intra-abdominal aneurysms.<sup>3</sup> More than 400 cases of SAA have been reported. The literature reports a 25% mortality rate for ruptured SAA.<sup>4</sup> The mortality rate among pregnant women is disproportionately high at 75% with a fetus mortality rate of 95%.<sup>5</sup> Twelve cases have been reported with survival of mother and fetus.<sup>6</sup> 65% of splenic aneurysms are presented in women and 50% of them rupture during pregnancy.<sup>7</sup> 12% of SAA during pregnancy rupture at the two first quarters, 69% at the third quarter, 13% at

childbirth and 6% at puerperium.<sup>8</sup>

In 25% of cases the phenomenon of “double rupture” is reported; initially the bleeding remains confined in the lesser sac, followed 6-96 hours later by free intraperitoneal haemorrhage and collapse.<sup>4,9,10,11</sup>

The aetiology of true SAA is obscure. Atherosclerosis and congenital defects of the arterial wall has been described as the major causes of SAA whereas others claim that atherosclerosis is a secondary event in SAA.<sup>12</sup> Increased blood pressure is considered to promote aneurysm formation.<sup>2</sup> Liver diseases with splenomegaly, repeated pregnancies, systemic hypertension and old age are certain clinical settings with a high incidence of SAA.<sup>2</sup> Acute and chronic pancreatitis has been described as the major causes of pseudoaneurysm.<sup>2,13</sup> Pseudoaneurysm is often presented in a pancreatic pseudocyst.<sup>14</sup> During pregnancy the uterus presses the aorta and the iliac arteries and the flow of blood in splenic artery is increased.<sup>6</sup> Because the diameter of uterus is bigger at the third quarter of pregnancy the most cases of ruptured splenic artery aneurysm are presented during this period. Another factor of increase incidence of ruptured SAA during pregnancy is the hormone relaxin which is responsible for the weakness of artery's wall.<sup>2,3,12</sup>

Except of the history and the patient's examination the Doppler ultrasound, the computerized tomography and the arteriography can help in diagnosis.<sup>2,15,16</sup>

Management of ruptured SAA requires awareness and aggressive surgical approach. Aneurysmectomy with splenectomy or left splenopancreatectomy, ligation of the proximal and distal splenic artery and aneurysmectomy for distal, mid and proximal third SAA respectively are the procedures described.<sup>2,17</sup> Splenic conservation is desirable but is difficult in emergency setting with ruptured SAA.<sup>17</sup> Angiography and embolization has been described for pseudoaneurysms and for unruptured true aneurysms.<sup>2</sup> In the high-risk patients, arterial embolization using coiling can be effective early in treatment, but arterial embolization in SAA secondary to pancreatitis was shown only to be palliative and needed to be complimented with surgical intervention. Arterial embolization is the method of choice in high-risk patients.<sup>18,19,20</sup>

### CONCLUSION

A diagnosis of ruptured SAA should be considered in any pregnant patient who complains of the sudden onset of severe left upper-abdominal pain regardless of whether pain

or shock is prominent at the time of evaluation. Early consideration of a diagnosis of ruptured SAA significantly increases the likelihood that the mother and fetus will survive.

### CORRESPONDENCE TO

Stavros Gourgiotis MD, Consultant in General Surgery, Clinical Attachment in Division of General Surgery and Oncology, Royal Liverpool University Hospital, Liverpool, U.K. Address: 21 Millersdale Road, Mossley Hill, L18 5HG, Liverpool, U.K. Telephone number (home): +44(0) 151 724 3272 Telephone number (work): +44(0) 151 706 4175 Fax: +44(0) 151 706 5798 E-Mail: drsgourgiotis@tiscali.co.uk & s.gourgiotis@liv.ac.uk

### References

1. Westeott JL, Ziter F. Aneurysms of the splenic artery. *Surg Gynaecol Obstet* 1973;136:541-546.
2. Mattar SG, Lumsden AB. The management of splenic artery aneurysms: experience with 23 cases. *Am J Surg* 1995;169:580-584.
3. Holdsworth RJ, Gunn A. Ruptured splenic artery aneurysm in pregnancy. A review. *Br J Obstet Gynaecol* 1992;99(7):595-7.
4. De Vries JE, Shattenkerk ME. Complications of splenic artery aneurysm other than intraperitoneal rupture. *Surgery* 1982;91:200-4.
5. O'Grady JP, Day EJ. Splenic artery aneurysm ruptures in pregnancy. *Obstet Gynaecol* 1977;50:627-30.
6. Herbeck M, Horbach T, Putzenlechner C, Klein P, Lang W. Ruptured splenic artery aneurysm during pregnancy: a rare case with both maternal and fetus survival. *Am J Obstet Gynaecol* 1999;181(3):763-4.
7. Barrett JM, Van Hooydonk JE, Boehm FH. Pregnancy-related rupture of arterial aneurysms. *Obstet Gynaecol Surv* 1982;37(9):557-66.
8. Macfarlane JR, Thorbjarnarson B. Rupture of splenic artery aneurysm during pregnancy. *Am J Obstet Gynaecol* 1966Aug 1;95(7):1025-37.
9. Lie M., Ertresvag K. Rupture of a splenic artery aneurysm into the pancreatic duct. *Acta Chir Scand* 1990;156:411-413.
10. Lowry SM, O'Dea TP, Gallagher DI, Mozentner R. Splenic artery aneurysm rupture: the seventh instance of maternal and fetus survival. *Obstet Gynecol* 1986;67(2):291-2.
11. Caillouette JC, Merchant EB. Ruptured splenic artery aneurysm in pregnancy. Twelfth reported case with maternal and fetus survival. *Am J Obstet Gynecol* 1993;168(6 Pt 1):1810-1.
12. Stanley JC, Fry WJ. Pathogenesis and clinical significance of splenic artery aneurysms. *Surgery* 1974;76:898-909.
13. Gangahar DM, Carveth SW. True aneurysms of the pancreaticoduodenal artery. *J Vasc Surg* 1952;2:741-742.
14. Lumsden AB, Riley JD, Skandalakis JE. Splenic artery aneurysms. Problems in General surgery - The spleen. JB Lippincott; 1990:113-121.
15. Busuttil RW, Brin BJ. The diagnosis and management of visceral artery aneurysms. *Surgery* 1980;88:619-625.
16. Derchi LE, Biggi E. Aneurysms of the splenic artery: Noninvasive diagnosis by pulsed Doppler sonography. *J Ultrasound Med* 1984;3:41-44.

17. De Perrot M, Buhler L, Deleaval J, Borisch B, Mentha G, Morel P. Management of true aneurysms of the splenic artery. *Am J Surg* 1998;175:466-468.  
18. Tarazov PG, Polysalov VN. Transcatheter treatment of splenic artery aneurysms. *J Cardiovasc Surg* 1991;31:128-131.

19. Reidy JF, Rowe PH. Splenic artery aneurysm embolization - the preferred technique to surgery. *Clin Radiol* 1990;41:281-282.  
20. Salam TA, Lumsden AB. Nonoperative management of visceral aneurysms and pseudoaneurysms. *Am J Surg* 1992;164:215-219.

**Author Information**

**Stavros Gourgiotis**

1st Surgical Department, "Evangelismos" General Hospital

**Panagiotis Alfaras**

1st Surgical Department, "Evangelismos" General Hospital