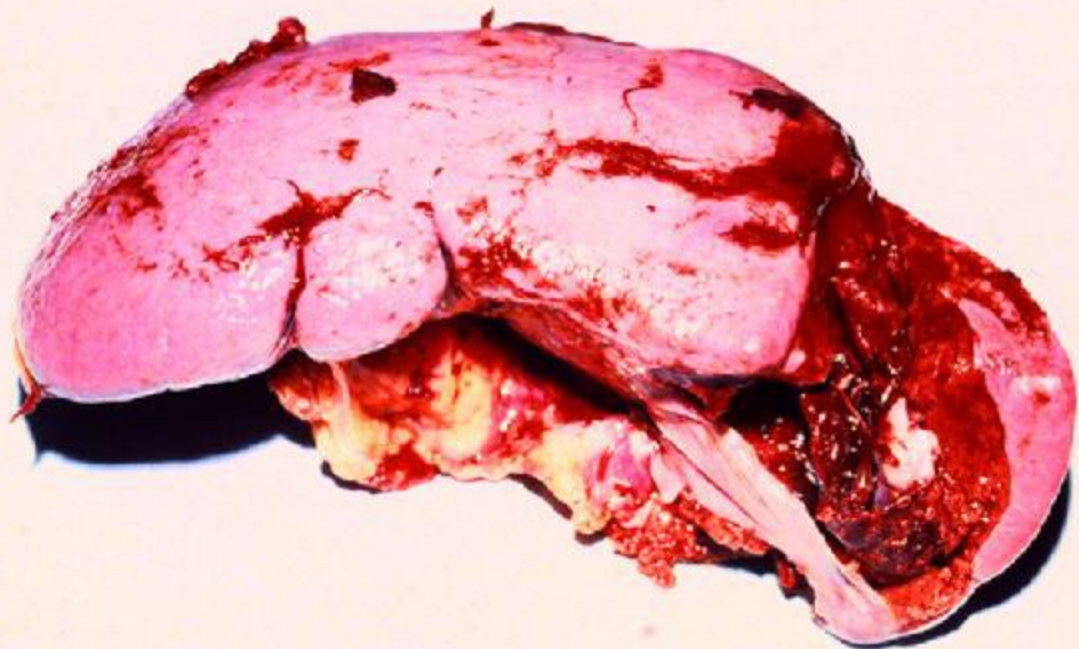


Conservative Management of Solid Organ Injury

INJURY 2003

SPLENIC TRAUMA



History of splenic trauma

- 90% mortality with non-op management (NOM) in 1912!
- 30-40% mortality with operative management, 1940

Why save the spleen?

- 1919

Morris, Bullock. The importance of the spleen in resistance to infection. Ann Surg; 70: 153

- 1952

King, Schumaker. Susceptibility to infection after splenectomy performed in infancy. Ann Surg; 136: 239

Overwhelming Post-Splenectomy Infection - OPSI

- Pneumococcus
- Meningococcus
- *H. influenzae*
- 0.5% splenectomized patients
- 50-80% mortality

Who is eligible for NOM?

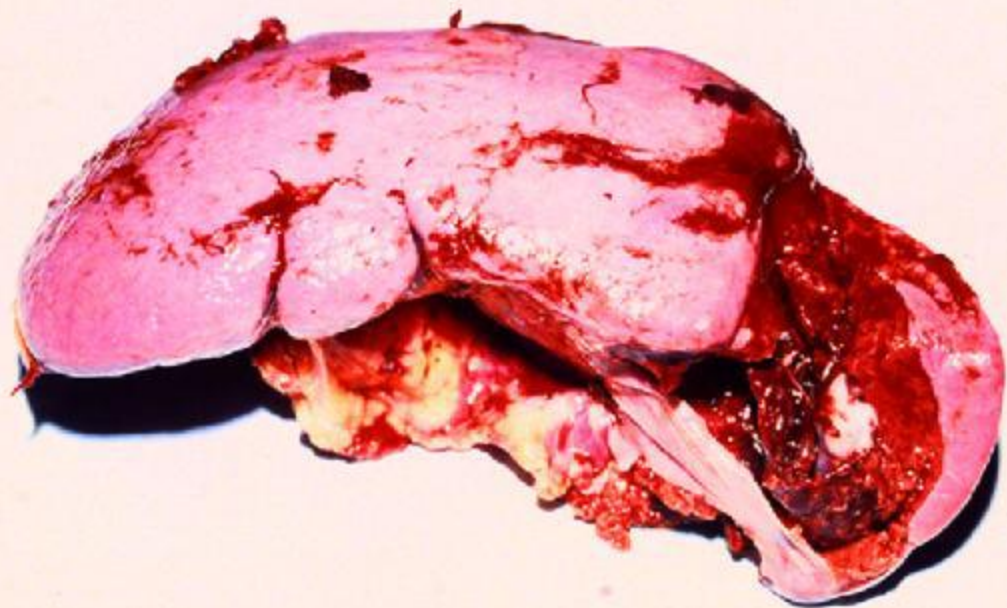
- hemodynamically normal after initial fluid bolus
- transfusion of \leq 2 units of packed red blood cells, or 40ml/kg (children)
- absence of other intra-abdominal injury requiring surgery
- management by a general surgeon
- 24-hour operating room capability
- intensive monitoring availability

Who is excluded from NOM?

- | | |
|----------------------|----|
| x High grade injury? | No |
| x Head injury? | No |
| x Elderly? | No |

Splenic Grade

- I <1cm deep lac.
- II 1-3cm lac
- III >3cm
- IV Segmental or hilar vessels, or >25% devascularisation
- V Completely shattered or devascularised



XY 133.5

Im: 11+C

13 FL 12/2513

03 Nov 00

512

DFOV 26.0cm

DETL

R

1

2

4

L

1

3

3

kV 120

mA 200~

Smart mA 200

Large %

7 0 mm / 1 E.1



- Sanders MN. Civil I.
- **Trauma Services, Auckland Hospital**
- **Adult splenic injuries: treatment patterns and predictive indicators.** *Australian & New Zealand Journal of Surgery.* 69:430-2, 1999
- 30% failed NOM
- CT grading of splenic injury is a predictive indicator

How else can we predict failure of NOM?

- **...Computed Tomographic Contrast Blush Predicts Failure of Nonoperative Management.**

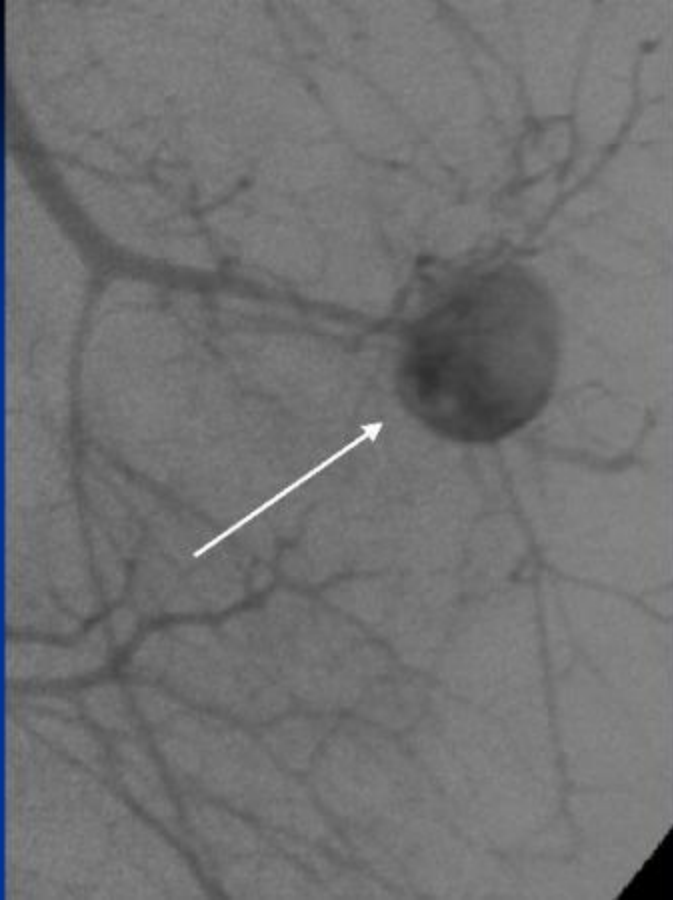
J Trauma 1995;39:507. Schurr, Fabian, Croce *et al*

- 'Blush' in 67% failed NOM, 6% success NOM



How can success rate be improved?

- **Improved Success in Nonoperative Management of Blunt Splenic Injuries: Embolization of Splenic Artery Pseudoaneurysms**
- J Trauma 1998; 44:1008. Davis, Fabian, Croce, *et al*
- Aggressive surveillance for and embolization of posttraumatic splenic artery pseudoaneurysms improved the rate of successful nonoperative management of blunt splenic trauma...



	Schurr	Davis
	1995	1998

Attempted NOM	29% →	66%
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Successful NOM	87% →	94%
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Overall successful NOM	25%	61%
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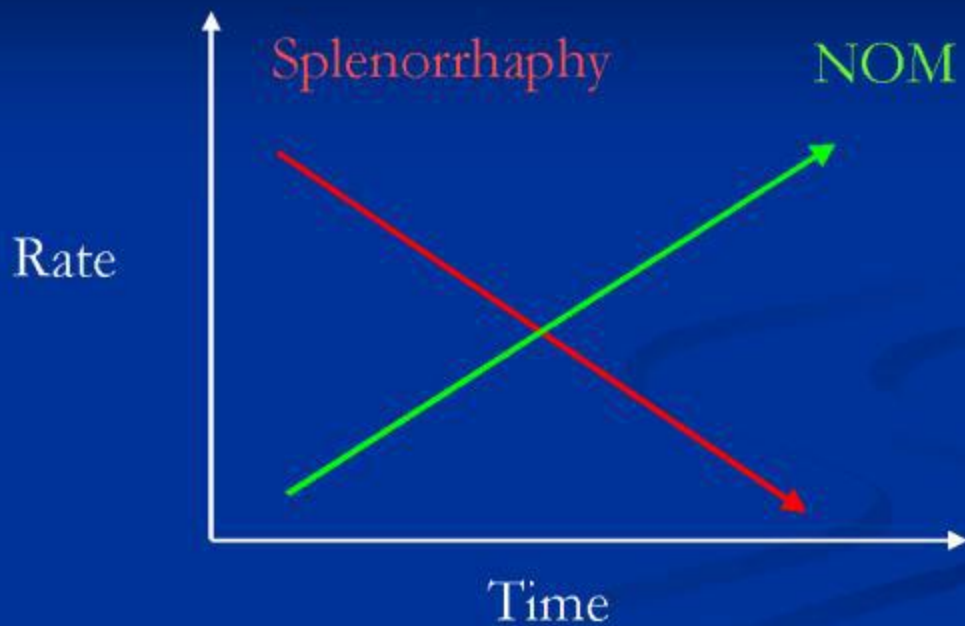
1995

1998

Overall successful NOM 25% 61%

Splenorrhaphy 20% 7%

Total spleens saved 45% 68%



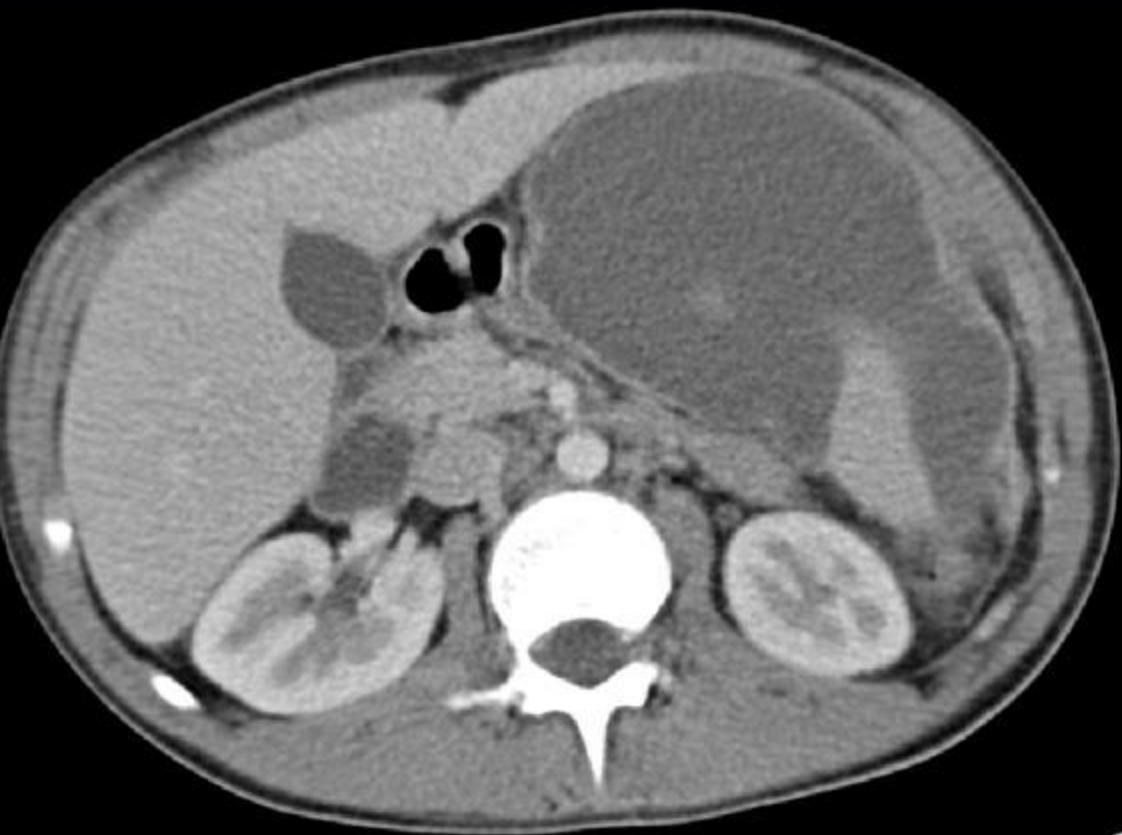
Success rate - children

- NOM 95%
- Success 95%

Complications of NOM?

- Delayed haemorrhage (4-8 days) 1.7%
- Splenic abscess 0.7%
- Missed intraabdominal injury 1%





04-JL
12





POST EMBOLISATION

LIVER TRAUMA



History of liver trauma

	Mortality
■ 1886, Edler. NOM →	67%
■ WW1	66%
■ WW2, early laparotomy	28%
■ Vietnam	15%

- While small lacerations of the liver substance may be, and no doubt are, recovered from without operative interference:
if lacerations be extensive and vessels of any magnitude are torn, haemorrhage will, owing to the structural arrangement of the liver, go on continuously.

JH Pringle, 1908

Non-operative management

- Children 1980's
- Adults 1990's

Who is eligible for NOM?


- hemodynamically stable
- transfusion of \leq 2 units of packed red blood cells, or 40ml/kg (children)
- absence of other intra-abdominal injury requiring surgery

What complications can occur?

- Bile leak
 - Haemorrhage
 - Hepatic abscess
 - Hepatic necrosis
- } ~10%



Can an injury be missed?

- Bowel
 - Pancreas
 - Diaphragm
 - Bladder
- 
- 5%

High success with nonoperative management of blunt hepatic trauma: the liver is a sturdy organ.

Archives of Surgery. 138:75; 2003

HYPOTHESIS: Nonoperative management of **liver** injuries is highly successful and rarely leads to adverse events.

SETTING: High-volume academic level I trauma center.

RESULTS:

78 patients

23 (29%) were operated on immediately

NOM failed in 8

The success rate of NOM was 85%

CONCLUSIONS: Nonoperative management of **liver** injuries is safe and effective regardless of the grade of **liver injury** ...

How are liver and splenic injury patients managed non-operatively?

OIS Grade	I	II	III	IV
ICU stay	0	0	0	1
Hospital stay (d)	2	3	4	5
Activity restriction(w)	3	4	5	6

Routing follow-up imaging? No







