

## Management of Splenic Injuries: An experience with 31 cases -A prospective study.

\*Dr. N. Dash

\* Professor

**Corresponding Address** : Department of Surgery, DVVPF Medical College, Ahmednagar, Maharashtra.

**Mail id**- niranjan\_dash@yahoo.com

**Mobile No.** - 9765725890

---

### Abstract :

Internal haemorrhage after blunt injury of the abdomen is a major cause of death specially in Majority of cases of involvement of spleen. Splenectomy is the treatment of Choice in most of the cases. However, conservative line of management or splenorrhaphy in haemodynamically stable patients is being tried in our series of 31 cases of splenic injury in a prospective study of consecutive 03 years. All patients diagnosed as spleen injury during the period of Jun 12 to Jun 15 from our institution were included in this study. Iatrogenic injuries during major cold surgeries were excluded. A total of 31 cases were included in this study. Out of 31 cases of splenic injury, 23 cases were managed by splenectomy. Seven cases were managed conservatively with bed rest and iv fluids. One young patient (09 years boy) was managed by splenorrhaphy. The rate of salvaged spleen following trauma has increased considerably with conservative line of management in haemodynamically stable patients.

**Key Words** : Spleen, Trauma, Non Operative Management (NOM)

**Back Ground**: Injuries are the major cause of medical burden and the major cause of loss of life in young and middle aged healthy individuals. Haemorrhage is the cause of deaths in maximum number of cases. For a bleeding patient reaching a hospital alive and damage controlled surgery is often performed with emphasis on the control of bleeding and contamination, followed by definitive surgery after resuscitation in the intensive care unit<sup>[1]</sup>.

In blunt abdominal trauma the spleen is the most frequently injured organ<sup>[2]</sup>. Most of the times, splenectomy has been performed to arrest the bleeding and to save the life in emergencies and it is found to be the treatment of choice. However, for haemodynamically stable patients with splenic injury, non-operative management (NOM) is an alternative. In

addition to avoiding a laparotomy, the greatest advantage of NOM is the preservation of splenic function, including full immuno competence and avoiding the increased risk of septicaemia<sup>[3,4]</sup>. NOM includes observation and/or splenic artery embolisation (SAE). We donot have the facility of SAE.

However, haemodynamically stable patients with spleenic injury were managed with NOM. The indications of NOM in haemodynamically stable spleenic injury patients depends on haemoperitoneum seen in CT examination<sup>[5,6]</sup>. Today the grading is based mainly on CT findings. The majority of patients are examined with CT before treatment decision are made.

The aim of the study is to describe the treatment of splenic injury and the potential chances and increased possibility of saving the spleen with conservative management (NOM) in haemodynamically stable condition.

**Materials and Methods** : The study is designed as prospective and observational study.

The inclusion criteria is : all patients including children admitted from Jun 2012 to Jun 2015 with diagnosis of spleen injury are included in this study. The exclusion criteria are: Iatrogenic spleen injuries during investigations and surgery were excluded.

**Parameters** : The patients are described with age, sex, mechanism of injury, classification and extent of Injury.

The primary outcome parameters are described with surgery, NOM and surgery following failure of NOM.

The secondary outcome parameters are described inform of complications leading to duration of hospital stay and death.

**Observations** : AGE – There is wide variation of age from 9 yrs to 60 years. However, maximum no of spleen trauma 10(32.25%) out of total 31 cases of spleen injury are in the age group 30 to 40yrs.

**Sex** – Out of total 31 cases 22 are males and 9 are females.

**Mode of injury** – Blunt trauma was the cause in 98% cases out of which 70% are due to Road Traffic Accidents.

**Severity of Injury** – There were 05 cases of Grade - III injury responded to NOM. There were 02 cases of Grade – II injury who responded to NOM also. Remaining 24 cases were having Grade – IV & V injury, landed up in splenectomy/splenorrhaphy.

**Management** – a) Splenectomy – 23

b) Splenorrhaphy – 01

c) NOM – 07

Other emergency surgical interventions including laparotomy and splenectomy were tube

thoracotomy – 02, craniotomy – 01 and external fixation of fractures – 02.

**Discussion :** During a consecutive period of 03 years, approximately 10 patients per year were admitted with Spleen Injury. A total no of 31 cases of spleen injury were included in this study.

Maximum no of patients involved in trauma of spleen was in age group 30 to 40 years of age. One patient was 09 years of age where splenorrhaphy was performed. Only 02 patients were more than 50 years of age where splenectomy was performed. Age variation is probably due to maximum outdoor activity and associated with commutation and road traffic accidents in this age group. Bee and Cocanour both described high rates of success when NOM was employed in (more than) 55 years old. Cocanour compared 375 patients stratified in to cohort with 55 yrs of age as a cut off (n=346<55 and n=29>55) and the failure of NOM did not significantly differ between two groups (17% and 14% respectively). On the other hand, Godley and co authors reported at 91% failure of patients >55 with splenic trauma<sup>[7]</sup>. In our series only 02 cases of spleen injury involved of 50 yrs of age and landed up in splenectomy. Hence, it is difficult to comment. Out of total 31 cases of spleen injury, 09 were females and 22 were males. It is probably due to more of indoor activity of females in comparison to males.

**Mode of injury** – Blunt trauma was the cause in 98% cases out of which 70% are due to Road Traffic Accidents. Most of the series are of same opinion. However, most of the cases spleen was found to be enlarged during surgery making it more prone for trauma probably malarial origin.

**Severity of Injury** – There were 05 cases of Grade - III injury responded to NOM. There were 02 cases of Grade – II injury who responded to NOM also. Remaining 24 cases were having Grade – IV & V injury, landed up in splenectomy/splenorrhaphy. It needs further study before commenting on grading of spleen injury and its relation to NOM.

**Management** - In our study, out of 31 cases of spleen injury, 23 cases landed up in splenectomy because of high grade of injury and associated hemodynamic instability. One patient of 09 years of age was managed by splenorrhaphy. 07 patients were managed by NOM conservatively. Two patients managed initially by NOM

(conservatively) landed up subsequently in operative treatment inform of splenectomy.

Splenectomy is historically the treatment of choice in spleen injury. However, CT scan and MRI has added advantage of diagnosing early depicting severity of injury. Though haemorrhage after blunt trauma is the main cause of death/early splenectomy which can be avoided with haemodynamically stable splenic injury cases.

In a large multi institutional spleen injury study conducted by the Eastern Association of the surgery of trauma published, the size of haemoperitoneum made a significant difference in the proportion of patients successfully managed non operatively. NOM was ultimately successful in 80% of patients with a small amount of blood versus only 27.4% with a large haemoperitoneum.<sup>[1]</sup>

Gonzales and associates reported the failure of NOM bases on quantity of haoperitoneum to be 10%, 22% and 48% for small, moderate and large amount of fluid respectively.<sup>[8]</sup>

In our study, we have given importance of hemodynamic status of the patient rather than haemoperitoneum (attributable to that) and achieved the rate of NOM to almost 22.25% which is similar to Gonzales and associate study. Actually it is very difficult to explain as the internal bleeding amount is a guess work rather than scientific in emergency situation.

Many studies have established the increased risks of infection in splenectomised patients, with particular susceptibility to pneumococcal, meningococcal and haemophilus infection. Shatz reported that 99.2% and Canadian trauma surgeons surveyed vaccinate their splenectomised patients though only 56% routinely gave all three vaccination.<sup>[9]</sup>

In our study, there was no complications following splenectomy during last one year of follow up.

**Conclusion :** In managing splenic trauma, an assessment of the overall clinical pictures is clearly more important than any specific evaluation. CT scanning has afforded the trauma surgeon in the selecting patients for NOM. However, early laparotomy/NOM remains the difficult decision on part of surgeon in difficult clinical situations of splenic injury.

Our study shows that after introduction of NOM, the salvage rate of injured spleen has increased considerably specially in haedynamically stable patients in low volume centres like us.

However, if the NMO fails, the surgeon should not be

hesitant to do splenectomy in emergency, so that a number of valuable lives can be saved.

**References :**

1. Gruen RL, Brohi K, Schreiber M, Balogh ZJ, Pitt V, Narayan M, et al. Haemorrhage control in severely injured patients. *Lancet*. 2012;380:1099-108.
2. Schroepel TJ, Croce MA. Diagnosis and management of blunt abdominal solid organ injury. *Curr Opin Crit care*. 2007;13:399– 404.
3. Olthof DC, Joosse P, van der Vlies CH, de Haan RJ, Goslings JC. Prognostic factors for failure of nonoperative management in adults with blunt splenic injury: a systematic review. *J Trauma Acute Care Surg*. 2013;74:546-57.
4. Skattum J, Naess PA, Gaarder C. Non-operative management and immune function after splenic injury. *Br J Surg*. 2012;99 Suppl 1:59-65.
5. *Medicine A for the A of A. Abbreviated injury Scale. Update 200*. Barrington, IL, USA: Association for the Advancement of Automotive Medicine; 2008.
6. Moore EE, Cogbill T, Jurkovich GJ, Shackford SR, Malangoni MA, Champion HR. Organ injury scaling: spleen and liver (1994 revision) *J Trauma*. 1995;38:323-4.
7. *Diagnosis And Management of Splenic Trauma*. Eric H. Bradburn, DO, Heidi L Frankel, *The Journal of Lancaster General Hospital*. Winter 2010. vol.5-No.4:124-129.
8. Gonzalez M, Bucker P, Ris F, Anderegg E, Morel P, [Splenic Trauma: Predictive factors for failure of non-operative management]. *J Chir (Paris)* 2008;2008;145:561-7.
9. Shatz DV, Vaccination Practices among North American Trauma Surgeons in splenectomy for trauma. *J. Trauma* 2002;53:950-6.