

Serious Liver Trauma: Predictive Factors Of Therapeutic Choice And Prognostic Factors (About 65 Cases)

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Abstract — The charge of the severe hepatic traumas underwent a radical change from exclusive surgical treatment to non-operative-based conservative approach that benefited from the recent advances in the field of imagery as well as from the follow-up strategies of intensive care.

A retrospective survey was carried out involving 65 patients treated for serious liver traumas in the surgical emergency department of Ibn Rochd university hospital of Casablanca.

The aim of this study is to assess our act refunding SLT through the definition of the evolutionary, therapeutic, diagnostic, and epidemiological data.

All the penetrating and blunt SLT were included in this survey. The seriousness was defined by the hemodynamic instability and a lesion stage higher to III according to the MIRVIS rating. The clinical and paraclinical data as well as morbidity and mortality were analyzed.

Traffic accidents were the main cause of SLT our series is mainly composed of young male subjects (54 men, 83%). There were 86% of blunt traumas (56 cases) there was common polytrauma (78,5%). Ultrasound and CT scans were performed to most patients (respectively 83% and 78%). Fifty one patients had non operative treatment (78,5%) whereas 14 patients underwent surgery. This option was due to their hemodynamic instability and not the hepatic trauma lesion stage in the operative group, the evolution was complicate in 35,7% of the operated patients whereas in the non operative group the complications supervened only in 23,5% of the cases. The mortality rate was respectively 28,5% versus 7,8% for the non operative treatment the NOT of the SLT allowed to obtain satisfactory results despite the seriousness of the hepatic lesions.

It should be anted that the treatment choice was made mainly according to the hemodynamic condition and not to the radiological stage lesions

A genuine and precocious agreement among the surgeon, the anesthesiologist and the interventional radiologist allowed to avoid the server complications following SLT so that the injured patient who could be initially rescued manage to escape first hour complications, and ultimately recover.

Index Terms — Liver; Blunt injury; Non operative Management; prognostic; Delayed surgery.

I. INTRODUCTION

Serious liver traumas are diagnostic and therapeutic emergency requiring a multi-disciplinary take-in-charge. They correspond to any hepatic trauma with or without parietal continuity solution, whose MIRVIS - CT ranking is

higher than III stage and/or combined to hemodynamic unsteadiness [1]. Serious liver trauma prevalence varies between 11,4% and 49% of all the hepatic traumas according to the series [2, 3, 4, 5, 6]. They are either due to penetrating traumas during road accidents or due to blunt traumas during aggressions with weapons. For years the operative treatment was considered the only therapeutic means in case of serious hepatic trauma. However, this attitude has progressively been turned into a more conservative approach thus avoiding urgent operating of the injured whenever possible. This dogma was also shaken by the concept of shortened laparotomy (damage control) in the form of a perihepatic compression of the liver. It is a process that has genuinely altered the management of SLT for which an emergency intervention was required before [7]. The presence of active arterial extravasation on the scanner with injected sequences accounts for hemostasis surgery. However, since the supervision of hepatic arterial embolization techniques (HAE) percutaneously, surgery is no more sought as the first intent. Nowadays, a better understanding of the symptomatology of the large uncontrolled haemorrhagies, the development of the arteriography, the embolization and the resuscitation (or intensive care) have allowed to opt for a conservative treatment in 80% of the cases of SLT [8] with an improvement of mortality rate that decreases from 28% to 7,9% [8, 9].

The aim of our study is to define the predictive factors of the therapeutic choice between a surgical and conservative treatment and the prognostic factors through a retrospective, analytic and descriptive study.

II. MATERIAL AND METHODS

Our retrospective survey involves patients having serious liver trauma admitted to the visceral emergency department (P35) of Ibn Rochd University Hospital of CASABLANCA over a period of 3 years that lies from January 2013 through 17th April 2016. In accordance with literature, the seriousness of the hepatic lesion was defined according to MIRVIS-CT rating. Only the patients having stage III hepatic lesion or more, with or without hemodynamic instability, were included. The patients who passed away or those with extra-hepatic hemodynamic instability were excluded.

A unvaried and multivaried analysis using SPSS 23.0

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version software was carried out in order to identify the predictive factors of the therapeutic choice as well as the prognostic factors, the results maintained as significant were those with $P \leq 0.05$.

TABLE I: MIRVIS-CT RATING

| Grade | Criteria |
|-------|---|
| I | Capsular avulsion, superficial fractures < 1cm in depth, sub-capsular hematomas < 1cm maximal thickness, periportal infiltration. |
| II | Fractures of 1 to 3cm in depth, central or sub-capsular hematoma of 1 to 3cm in diameter. |
| III | Fracture(s) of > 3cm in depth, central or sub-capsular hematoma of > 3cm. |
| IV | Central or sub-capsular massive hematoma of > 10cm, lobar tissular destruction or devascularization. |
| V | Bilobar tissular destruction o devascularization. |

III. RESULTS

During the same period, 255 patients were hospitalized for abdominal contusion. 25,4% showed S L T of which 83%, were penetrating traumas. The mean age was 32 years with an age interval of 15 to 60 years of which males represent 83,1%. Road accidents were the most frequent cause (63,1%). A quarter of the patients showed hemodynamic instability at admission. The RTS score was 7,07 in average. The right hypochondrium pain was predominant in the clinical symptomatology.

Hemoglobin was ≤ 9 g/dL in 34% of the patients and 94% showed hepatic cytolysis. Half of our patients underwent abdominal echography showing a peritoneal outpouring and in 51% of the cases, there was a case of hepatic contusion.

Practically all our patients underwent TDM revealing hepatic confusions in 52 patients hepatic fractures in 10 patients and subcapsular hematoma in III patients among whom one patient had the 3 lesions at the same time. These hepatic lesions were MIRVIS stage III in 78,1%. Twenty percent of the patients had stage IV and stage V was detected only in one case. Intensive care measures were taken of all patients. The onset laparotomy was advised in 22% of the patients whose hemodynamic instability was not rectified by intensive care measures was the cause for 11 patients and the suspicion of the perforation of the digestive tube in 3 patients. The liver had already made its hemostasis in 57% of the patients and in 43% it required a peri-hepatic compression which was a suture. There was a wound of the lower vena cava in 1 patient.

The average stay in hospital was 12 days. The evolution was favorable in 5 patients. The rest of the patients showed complications. Mortality rate was 28,5% in the operative treatment group. During our survey 78% of the patients underwent a non operative treatment based on a strict surveillance in surgical milieu outside the hemodynamic instability or acute abdomen signs. The duration of the hospital stay was 7 days in average. The evolution was favorable for 76,5% of the cases whereas 23,5% of the cases had complications among whom 11 patients had secondary surgery for extra-hepatic cause for most of these patients. The mortality rate was 7% in this group.

The analytic survey of the quality and quantity variables

allowed us to detect the predictive factors of the therapeutic choice between a OT and a NOT and the prognostic factors showed in the tables 2 and 3.

TABLE II: PREDICTIVE CHART OF MORTALITY

| Variables | Survivors N=57 | | Non survivors N=8 | | P |
|--|----------------|-----------|-------------------|---------|--------------|
| | Mean | N (%) | Mean | N (%) | |
| Age | 31,54 | | 40,58 | | 0,01 |
| Male gender | | 48 (84) | | 6 (75) | 0,6 |
| Polytrauma combined lésions) | | 41 (71) | | 6 (75) | 0,04 |
| Open trauma | | 7 (12) | | 2 (25) | 0,008 |
| Delays of hospitalization | 7,14 | | 26 | | 0,001 |
| Clinical study: | | | | | |
| Cardiac frequency | 96 | | 93 | | 0,4 |
| Respiratory frequency | 22 | | 22 | | 0,9 |
| Glasgow score | 13 | | 8,2 | | 0,009 |
| RTS score | 7,22 | | 5,92 | | 0,05 |
| Unstable HD at admission | | 11 (19) | | 4 (50) | 0,02 |
| Biology at admission: | | | | | |
| Hemoglobine | 10,5 | | 8,6 | | 0,05 |
| Platelet rate | 196946 | | 185428 | | 0,76 |
| Protrombin rate | 72,04 | | 50,71 | | 0,002 |
| ALAT/ASAT | 355/33 | | 822/18 | | 0,2/0,1 |
| Urea/creat | 8 0,4/12 | | 77 0,6/20 | | 0,1/0,2 |
| Transfusion parameters: | | | | | |
| Globular base | 0,87 | | 3,38 | | 0,02 |
| Plate base | 0,35 | | 2,5 | | 0,28 |
| FFP | 0,72 | | 3,63 | | 0,1 |
| TDM data: | | | | | |
| Hémoperitoineum of great abundance | | 10 | | 4 | 0,1 |
| TGF selon Mirvis | | 53 | | 8 | 0,2 |
| Treatment end evolution: | | | | | |
| Complication / mortality | | 10 | | 4 | 0,03 |
| Duration of hospitalization stay | 8,9 | 13 (22,8) | 8,2 | 8 (100) | 0,7 0,001 |

IV. CONCLUSION

SLT mainly affects the young adult most frequently during road accidents. It is rarely isolated and often integrated in a poly-trauma context. The hemorrhagic shock remains the first decisive element in the take-in-charge of the SLT. The setting of the non operative treatment and its consideration as a first-choice treatment for the hepatic lesions, with a success rate reaching 95%, It eventually concerns more than 80% of the serious traumas of the liver (SLT).

The non operative take-in-charge is characterized by the existence of a very effective therapeutic trio: Radiology with injected TDM and hepatic arterial embolization, careful armed surveillance and finally the deferred operation. The latter is not to be considered as a failure of the take-in-charge by the non operative treatment. On the contrary, it is an integrated part of the therapeutic strategy.

TABLE III: OPERATIVE TREATMENT END NON OPERATIVE TREATMENT

| Variables | Non operative treatment N=51 | | Operative treatment N=14 | | P |
|---|------------------------------|------------|--------------------------|------------|-----------|
| | Mean | N (%) | Mean | N (%) | |
| Age | 31,63 | | 36,29 | | 0,18 |
| Male gender | | 44 (86,27) | | 10 (71,42) | 0,18 |
| Polytrauma combined lésions) | | 36 (70,5) | | 11 (78,5) | 0,39 |
| Delays of hospitalization | 6 | | 5,2 | | 0,06 |
| Open trauma | | 4 (7,84) | | 5 (35,71) | 0,007 |
| Clinical study: | | | | | |
| Cardiac frequency | 95 | | 98 | | 0,5 |
| Respiratory frequency | 22 | | 25 | | 0,2 |
| Glasgow score | 13 | | 11 | | 0,09 |
| RTS score | 7,34 | | 6,05 | | 0,003 |
| Unstable hemodynamic condition at admission | | 5 (9,80) | | 11 (78,57) | 0,001 |
| Biology at admission: | | | | | |
| Hemoglobine | 10,7 | | 8,4 | | 0,002 |
| Plateles rate | 204313,7 | | 158916,6 | | 0,13 |
| Protrombin rate | 71,9 | | 60,1 | | 0,039 |
| ALAT/ASAT | 352,8/327,2 | | 637,4/1282,7 | | 0,05/0,1 |
| Urea/creat | 0,4/12,49 | | 0,47/16,5 | | 0,58/0,21 |
| Transfusion parameters: | | | | | |
| Globular base | 0,71 | | 2,86 | | 0,003 |
| Plate base | 0,18 | | 2,21 | | 0,001 |
| FFP | 0,53 | | 3,07 | | 0,008 |
| TDM data: | | | | | |
| Hémopéritoineum of great abundance | | 10 (19,6) | | 7 (50%) | 0,001 |
| Treatment end evolution: | | | | | |
| Complication | | 12 (23,5) | | 9 (64,3) | 0,04 |
| Mortality | | 4 (7,8) | | 4 (28,5) | 0,03 |
| Duration of hospitalization stay | 7,96 | | 12 | 8 (100) | 0,009 |

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