ISSN: 0975-3583, 0976-2833 VOL9, ISSUE3, 2018

Original Research Article

To diagnoses the development of Abdominal Comportment Syndrome in blunt trauma abdomen patients

Dr. Rakesh Pancholi[1] (Associate Professor), Dr. Sunil Kumar Gehlot[2] (Associate Professor), Dr. Muffazzal Rassiwala[3] (Associate Professor), Dr. Gourav Kumar Saxena[4] (Assistant Professor), Dr. Amol Daniel[5] (Assistant Professor)

Dept. of Surgery, Index Medical College Hospital & Research Centre, Indore, M.P.[1,2,3,4,&5]

Corresponding Author: Dr. Sunil Kumar Gehlot

Abstract

Background & Methods: The aim of the study is to diagnoses the development of Abdominal Comportment Syndrome in blunt trauma abdomen patients. IAP can be measured by direct or indirect methods. Though the direct methods are quite accurate over all ranges of IAP, it is impractical and not feasible for routine practice. Indirect pressure measurement is done through Inferior Vena cava, gastric, rectal and Urinary Bladder. However, the simplest and the method of choice is transurethral measurement of UBP using a Foley's catheter. The bladder is drained and then it is filled with 25 ml of normal saline.

Results: Mortality among operated patients with ACS is 22.22% while much lower among patients without ACS 3.84%. ACS complicated cases, mortality was 22.22% and that in cases without ACS was 3.25%.

Conclusion: Incidence of Abdominal Compartment Syndrome has been found to be 6.8% in studied blunt trauma abdomen patients. Incidence of intra-abdominal hypertension has been found to be 10.6%. Development of ACS from IAH can be prevented by conservative management. Selected cases of ACS can also be managed by conservative methods without open surgical technique.

Keywords: Abdominal Comportment Syndrome, trauma & abdomen.

Study Design: Observational Study.

1. Introduction

Compartment syndrome occurs when the pressure within a closed anatomic space (a compartment) becomes so elevated that capillary perfusion is compromised and tissue ischemia develops[1]. Compartment syndromes are classically thought of as complications associated with orthopaedic trauma, occurring when muscular compartments of extremities develop elevated pressures requiring decompressive fasciotomies. However, any closed anatomic space, including the abdominal cavity, is at risk of developing a compartment syndrome[2]. Abdominal compartment syndrome is a clinical disease spectrum that results from elevated intra-abdominal pressure (IAP) due to tissue edema or free fluid collecting in the abdominal cavity. Elevated pressure in the abdomen is referred to as intra-abdominal hypertension (IAH) while the end stage organ failure that occurs due to the pathophysiologic derangements that occur as a result of increasing intra-abdominal pressure is referred to as the abdominal compartment syndrome (ACS). This clinical spectrum dramatically impacts patient outcome: The end result of undetected and untreated intra-abdominal hypertension is multisystem organ failure and patient death[3].

The history of IAHT and ACS are typical of any medical innovation: described, forgotten, re-discovered, and faced with skepticisms and ridicule[4]. Eventually, after being scientifically

ISSN: 0975-3583, 0976-2833 VOL9, ISSUE3, 2018

proven and re-proven and supported by "clinical leaders" and widely published in reputable journals—it is accepted as "truth. For as long as humans existed, abdomens ballooned with gas, fluid, blood, pus resulting in all the physiological changes that we today call intra-abdominal hypertension (IAHT) and ACS[5]. Obviously, IAHT and ACS always existed but were not understood as such.

2. Material and Methods

Present Study was conducted at Index Medical College Hospital & Research Centre, Indore, M.P. IAP can be measured by direct or indirect methods. Though the direct methods are quite accurate over all ranges of IAP, it is impractical and not feasible for routine practice. Indirect pressure measurement is done through Inferior Vena cava, gastric, rectal and Urinary Bladder. However, the simplest and the method of choice is transurethral measurement of UBP using a Foley's catheter. The bladder is drained and then it is filled with 25 ml of normal saline. This saline in the bladder acts as a passive diaphragm for pressure transmission. The drainage tube is clamped beyond the aspiration port and a 16-gauge needle is inserted into the port. The tubing is then attached to water manometer or a pressure transducer, at the end of expiration in supine position, using the midaxillary line as the zero reference point.

3. Result

Table 1: Sex ratio in the present study

Sex	With ACS	With IAH	Normal	Total
Male	09	12	101	122
Female	00	02	08	10
Total	09	14	96	132

In the present study male: female ratio was 1:1.16.

Table 2: Age Distribution among IAH PTS

Age In Years	No of cases
20-30	00
30-40	03
40-50	09
50-60	02
>60	00

Table 3: Showing Mortality among Operated Patients

	With ACS	Without ACS
No of pts. operated	09	26
Death	02	01

Mortality among operated patients with ACS is 22.22% while much lower among patients without ACS 3.84%.

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Table 4: Showing Outcome of ACS in the Studied Group of Patients

Blunt trauma abdomen	Discharge	Deaths
With ACS	07	02
Without ACS	119	04

The present study shows that in ACS complicated cases, mortality was 22.22% and that in cases without ACS was 3.25%.

4. Discussion

Abdominal trauma can result in the increase of IAP for a variety of reasons, including the accumulation of blood or free fluid in the peritoneal cavity, edema of the intestinal wall, retroperitoneal hematoma or abdominal packing for hemorrhage control. Therefore the continuing hepatic hemorrhage and increasing amounts of bloody ascites found in failed NOM can lead to an elevation in IAP[6]. ACS with multiple organ dysfunction is a consequence of the effects of IAH on multiple organ systems.

Elevated IAP results in impaired physiology and organ functions due to the limited abdominal wall compliance. In patients with severe trauma the incidence of ACS has been reported at 14 % − 15 % after damage control laparotomies. To date there are very few reports describing the changes in IAP or the development of IAH or ACS while the patients are receiving NOM after BAT[7].

Similar to Croce et al. who reported mean transfusion requirement in first 48 h to be 1.9 units our overall mean transfusion requirement was 1.93 units however no limitation of transfusion requirement was mentioned. Most authors favour the ultimate decisive factor of NOM should be hemodynamic stability of the patient[8].

The pathophysiology of IAH has been described in many organ systems. The cardiac system is affected when IAPs are elevated because the external pressure exerted on the inferior vena cava leads to diminished venous return and thus decreased cardiac output[9]. The pulmonary system is affected largely because of pressure-induced cephalad displacement of the hemidiaphragms and creating a functional restriction of diaphragmatic excursion and pulmonary expansion. Patient's exhibit decreased respiratory compliance, hypoxemia (relative or absolute), decreased CO2 clearance, and distorted pulmonary flow characteristics[10].

5. Conclusion

Incidence of Abdominal Compartment Syndrome has been found to be 6.8% in studied blunt trauma abdomen patients. Incidence of intra-abdominal hypertension has been found to be 10.6%. Development of ACS from IAH can be prevented by conservative management. Selected cases of ACS can also be managed by conservative methods without open surgical technique.

6. References

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