INTRODUCTION

Liver, a vital organ in our body has various functions like synthesis, storage, secretion, etc. They secrete many biologically active substances and markers including enzymes. Serum bilirubin, enzymes such as Aspartate aminotransferase (AST), Alanine aminotransferases (ALT), and Gamma glutamate aminotransferase (GGT) are taken as liver function test parameters. These intracellular enzymes are normally found in blood in minimal amount which represents the normal cellular turn over, while elevated levels are associated with liver cell injury. During any intra abdominal surgery particularly laparotomy, the chances of liver injury is more due to anaesthetic drugs, intra-operative infections or even due to mechanical pressure exerted by liver retractor during surgery. This injury may lead to release of intra cellular liver enzymes elevation post-operatively\(^1\). Herewith we present a case in which the mechanical pressure given by liver retractor during emergency laparotomy led to liver cell injury and acute transient elevation of transaminases called Retraction transaminitis\(^2\).

CASE HISTORY

A 23 yrs old primigravida, with 4 months amenorrhoea was admitted in Institute of Obstetrics and Gynaecology, Egmore for acute abdominal pain. Her presenting complaint was sudden onset of abdominal pain in the left side for 2 days which gradually aggravated with mild fever and blood in urine. No history of injury or any trauma in recent days. Menstrual and marital histories were normal and she has conceived naturally.

On General Examination

Pulse rate: 98/min, B.P: 100/60 mmHg, Respiratory rate: 15/min, Temperature: 99\(^o\) F, No pedal edema.

Abdominal examination

Over distended abdomen with a mass in the supra pubic and left Iliac fossa was noted. The uterus was of 16-18 weeks size and shifted to Right Iliac fossa.

UltraSonogram

Huge twisted left ovarian cyst complicating the pregnancy (19 weeks) was noted.

Routine investigations such as Complete blood count & Biochemical investigations were performed and were found to be in normal range except anaemia (Hb: 5.5 g/dL) for which blood transfusion was done.

<table>
<thead>
<tr>
<th>Name of the test</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random blood Glucose</td>
<td>87 mg/dL (80 - 120 mg/dL)</td>
</tr>
<tr>
<td>Urea</td>
<td>18 mg/dL (8 - 23 mg/dL)</td>
</tr>
<tr>
<td>Serum Creatinine</td>
<td>1.0 mg/dL (0.6 - 1.2 mg/dL)</td>
</tr>
<tr>
<td>Serum Total Bilirubin</td>
<td>0.8 mg/dL (0.8 - 1.2 mg/dL)</td>
</tr>
<tr>
<td>Serum AST ( SGOT)</td>
<td>40 IU/L (&lt;1 IU/L)</td>
</tr>
<tr>
<td>Serum ALT ( SGPT)</td>
<td>15 IU/L (&lt;34 IU/L)</td>
</tr>
</tbody>
</table>

TABLE: 1 Pre-operative (on the day of admission) biochemical investigations:
Emergency Laprotomy - Left ovariectomy was done under general anaesthesia. Immediate post-operative period was uneventful and the patient was apparently healthy without any symptoms. Biochemical investigations were performed as routine in which it was observed that serum bilirubin and transaminases were elevated while the Renal function and haematological tests were within the normal reference limit. Hence, serial measurements of liver function tests were performed and the results are given in Table 2. Fig: 1 Shows the trend of serum transaminases (AST &ALT) during the post operative days in this case.

Post operative LFT values showed that Total Bilirubin, AST & ALT raised transiently from 1st day to 3rd day which then decreased and reached the base line by 12th day.

<table>
<thead>
<tr>
<th>Postoperative days</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Total Bilirubin (mg/dL)</td>
<td>1.0</td>
<td>3.2</td>
<td>3.5</td>
<td>3.0</td>
<td>2.4</td>
<td>1.6</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>SGOT/AST (IU/L)</td>
<td>72</td>
<td>1299</td>
<td>1469</td>
<td>1260</td>
<td>107</td>
<td>54</td>
<td>51</td>
<td>29</td>
</tr>
<tr>
<td>SGPT/ALT (IU/L)</td>
<td>59</td>
<td>629</td>
<td>540</td>
<td>365</td>
<td>162</td>
<td>74</td>
<td>53</td>
<td>24</td>
</tr>
</tbody>
</table>

**TABLE-2: Biochemical investigations during postoperative days.**

**DISCUSSION**

From the results obtained in the postoperative days for this patient, we infer that liver cell injury has occurred during the laparotomy procedure causing release of intracellular enzymes.

Causes of Injury to Liver during Laprotomy:
1. Anaesthetic drug (Eg: Halothane, Sevoflurane)
2. Infection
3. Mechanical injury

**Anaesthetic drug induced injury**

If the injury is due to anaesthetic drug then the patient will show the features of fulminant hepatitis like fever, rashes, arthralgia, hepatomegaly, jaundice, eosinophilia. Elevation of enzymes (AST/ALT) will occur only after one week that peaks by 2nd week and then declines. Immediate aggressive treatment is required for this condition.

**Infection induced liver injury**

If the injury is due to infection, then the enzymes will be elevated as per the incubation period (15-45 days). It will be definitely accompanied with symptoms of inflammation, fever, Jaundice, abdominal pain, hepatomegaly. Even here, the cause must be treated immediately.

**Mechanical injury to Liver**

In surgeries where liver retractor is applied for longer time, the mechanical pressure exerted on liver by the retractor can cause liver ischemia, injury and consequent rise in liver enzymes in the post-operative days. They have the typical picture of enzyme elevation starting from the day of surgery which gradually peaks by 3rd day then falls back to the normal level. As this is a transient elevation, the patient will be asymptomatic unlike other causes of liver injury.

The pressure applied and duration of application of retractor plays a vital role in producing injury to the organ. Prolonged pressure or higher pressure exerted causes ischemic injury and release of intra cellular liver enzymes to the blood leading to elevation of AST and ALT (Transaminases). This elevation of Transaminases during laparotomy following liver retractor application is termed as Retraction transaminitis. This is a benign transient condition which reverses completely without any residual impairment. Here in this case, the patient was absolutely asymptomatic throughout the post operative period eventhought biochemically she had elevated liver function test parameters. The pattern of Transaminase elevation observed in this case was similar to mechanical pressure induced injury to liver by retractor, and hence it was diagnosed as Retraction transaminitis. The cause for serum bilirubin elevation is probably the blood transfusion for anaemia correction. About 10% of erythro-
RBCs in stored blood will undergo hemolysis within 24 hrs of blood transfusion. When 500mL of blood is transfused 7.5 g of hemoglobin is obtained and 250 mg of bilirubin is expected to be released which is handled by the liver and this causes hyperbilirubinemia for a short period of time. This explains the hyperbilirubinemia present in this patient.

Retraction transaminitis is commonly found in laparoscopic surgeries such as Gastric fundoplication but noted in laparotomy surgery in this case and hence should be considered in managing all (abdominal) post-operative conditions.

CONCLUSION

Retraction transaminitis is a transient and a very rare condition occurring <1/1000 laparotomy surgeries. This condition should be considered in evaluating high transaminase values in an otherwise asymptomatic postoperative patient. Retraction transaminitis is purely a biochemical diagnosis and does not require any treatment as the liver cells recovers quickly and the transaminases returns to baseline within a short period of time. This benign condition should be considered in the post operative management of abdominal surgeries.

REFERENCES

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