Abstract: Diaphragm is a musculoaponeurotic barrier dividing thoracic cavity from that of abdominal. Traumatic diaphragmatic rupture is a rare clinicopathological entity & a missed diagnosis. Diaphragmatic injury may result in the development of delayed herniation & strangulation of abdominal organs into the thoracic cavity. Spontaneous (effort or delayed) rupture of diaphragm is rarely seen with the incidence of approx 1% without obvious blunt trauma of abdomen. This poses a great difficulty to the surgeons and radiologists to diagnose. Very easily the diagnosis is missed or confused with pneumothorax or hydropneumothorax. The Spontaneous rupture of Right sided diaphragm is very rare in comparison to left sided rupture. Diaphragmatic hernia without trauma in adults is a very rare entity. The reported cases of Right sided diaphragmatic hernia in literature so far is only less than 20. We report 2 cases of Right sided spontaneous delayed diaphragmatic hernia, who presented in our out patients clinic with the chief complaint of breathlessness on exertion. In both the cases, the defect was repaired with primary closure & reinforced with marlex mesh.

Keywords: Ruptured diaphragmatic hernia, spontaneous diaphragmatic hernia, strenuous athletic exercise, blunt abdominal injuries, Motor vehicle accidents & Effort diaphragmatic rupture.

INTRODUCTION:
In 1848, Vincent Alexander Bochdalek first described the nonfusion of Posterolateral Right or Left foramina of diaphragm leading to mainly left sided Bochdalek hernia (Salacin, S. et al., 1994; & Haller, J. A. 1986).

The diaphragm is dome shaped Musculotendinous structure, which is located between Thorax & Abdomen and separating the thoracic contents from that of abdominal cavity. It consists of central tendon with Right & Left leaflets composed of striated muscles. Three large openings for Oesophagus, Aorta & IVC disrupt the continuity of diaphragm. The diaphragm plays an important role in respiratory function too (Petrone, P. et al., 2017; & Thiam, O. et al., 2016).

Though the traumatic diaphragmatic rupture is a rare clinicopathological condition (Yamaguchi, M. et al., 2002; & Mullins, M. E. et al., 2001), yet it may occur due to the location of diaphragm that it exposes to the injuries either by closed (blunt) or penetrating trauma through the thoracoabdominal transition area on either side (Petrone, P. et al., 2017; & Thiam, O. et al., 2016).

Right sided diaphragmatic rupture is less common than that of left side, which is due to the protective anatomic lie of liver which acts as buffer, therefore it becomes difficult challenge to diagnose Right diaphragmatic injury, because the clinical signs are often nonspecific (Yamaguchi, M. et al., 2002; & Mullins, M. E. et al., 2001). A spontaneous ruptured (acquired) diaphragmatic hernia without any apparent h/o trauma or any violent activity which leads to Valsalva maneuver causing a sudden surge in abdominothoracic pressure gradient, is an even more rare presentation & difficult to diagnose.

Approximately less than 20 cases of right sided ruptured diaphragm without apparent trauma have been reported in the literature so far (Kumar, A. et al., 2009). Here we are reporting 2 more such cases of right sided spontaneous (delayed/efforts) diaphragmatic hernia.
Incidence: Petrone et al., (2017) reported traumatic diaphragmatic hernia 75% on Left side & only 25% on Right side, whereas other authors have reported more than 80% Left sided diaphragmatic rupture (Kaur, R. et al., 2015; & Ragalie, G. F. et al., 1984). However, an increase in incidence on Right sided diaphragmatic rupture being reported due to an increased improvement in imaging techniques (Petrone et al., 2017).

Traumatic diaphragmatic hernias frequently caused by pretreating abdominal injuries are 10-19% whereas blunt thoraco abdominal trauma causes only 5% (Mariadason, J. G. et al., 1988).

Mechanism of injuries: The diaphragm separates the negative pressure thorax from that of positive pressure abdomen. The rupture of diaphragm occurs when intra abdominal pressure suddenly rises above the tensile strength of diaphragm. The commonest cause of spontaneous acquired diaphragmatic disorders is by trauma, which may either be blunt or penetrating. The blunt trauma produces larger radial tears of 5-15 cm of the diaphragm. Blunt diaphragm injury occurs more frequently on Lt side due to the congenitally weak area in the diaphragm.

Diaphragmatic rupture (Tsukioka, K. et al., 1989), may be:
  a. Indirect or tension type -----due to distortion of bony thorax.
  b. Direct or impact type------ resulting from blunt force on the bony thorax

The most common mechanism of spontaneous rupture of diaphragm involves sudden & forceful Valsalva maneuver that can lead to an in-coordination between the expiratory muscles causing rupture (Shanmuganathan, K. et al., 2000). This Valsalva maneuver causes a sudden increase in abdomino thoracic pressure gradient, which is believed to be the primary underlying mechanism responsible for diaphragmatic rupture. Relatively less pressure is required to disrupt the diaphragm in spontaneous (effort) rupture in comparision to blunt traumatic diaphragm rupture.

Mechanism of rupture may be due to.
  ➢ Shearing of a stretched membrane/diaphragm thought to be an important factor in pathogenesis of the diaphragmatic hernia (Kearney, P. A. et al., 1989).
  ➢ Avulsion of diaphragm from its points of attachments
  ➢ Sudden transmission of force through viscera acting as viscous fluid.

The spontaneous closure of the diaphragm tear is unlikely because of abdomino thoracic pressure gradient & the progression to enlargement of the defect which lead to thoracic herniation of intra-abdominal viscera.

The factors increasing intra-abdominal pressure and abdominothoracic pressure gradient can be pregnancy (parturition) (Watkin, D. S. et al., 1993), child birth (vaginal delivery) (Hamaji, M. et al., 2013) blunt abdominal trauma, sneezing, violent vomiting & coughing (George, L. et al., 2000; & Fenner, H. et al., 2019), excessive retching, strenuous physical exercise & dancing (Bisgaard, C. et al., 1985) or athletic events e.g. Heavy weight lifting (Nichat, P. D. et al., 2004; & Jha, P. t al 2004), straining at stool (i.e. Valsalva maneuver for constipation) (Barclay-Buchanan, C. J., & Herzog, E. S. 2017), asthma & pertusis and even large meals can increase the risk of herniation. Road traffic accident is another most common cause (Temizöz, O. et al., 2010).

Hernial contents: The hernial contents depend on the type and site of injury and the side of the diaphragm ruptured. Mostly the diaphragm rupture occurs on Left side than right side. Hence the hernial contents may be Liver, stomach, colon, spleen, pancreas, greater omentum & large bowel etc. Aydin Kurt et al., (2004) reported these viscera as the hernial contents in non-traumatic right diaphragmatic hernia for the first time.

Diagnosis: Diagnosis is based on clinical presentation. A spontaneous rupture implies an absence of trauma, but there is always the possibilities that a diaphragmatic defect arose from some forgotten trauma in the past (Jha, P. et al., 2004). Hence acquired diaphragmatic hernias are usually traumatic & blunt thoraco abdominal trauma accounts for 75-81% of all the diaphragm trauma cases (Simpson, J. et al., 2000). Depending on the side of the diaphragmatic rupture, size of the defect and the hernial contents, the symptoms may be related to pulmonary, gastro intestinal or a combination (Losanoff, J. E., & Sauter, E. R. 2004).

The symptoms in adult spontaneous diaphragmatic hernias are usually or predominantly chronic, vague & Intermittent in nature but can present acutely with constant & special symptoms (25). The symptoms relating to GIT, the patient can have recurrent abdominal pain, back pain, abdominal distension, post prandial fullness, nausea & vomiting, whereas the respiratory symptoms in the adults are less common yet the patient may present to the outpatient clinics with c/o shortness of breath, breathlessness on exertion (Dyspnoea), Cyanosis, Chest pain, Palpitation or referred pain to shoulder.
**Imaging 1. X-ray chest:** There is no single investigation that provides a reliable diagnosis of traumatic diaphragmatic hernia with bowel contents or coiled NG tube in the chest at initial presentation. Though, the diagnosis of diaphragmatic hernia may be obvious, still the routine Chest X-ray is non diagnostic in upto 40% of cases. This percentage may further be reduced in intubated patients with positive pressure ventilation, which prevents herniation of abdominal contents into the chest. Further, it could be difficult to differentiate from diaphragmatic abdominal hernia especially a “hernial sac”. Right sided diaphragmatic injuries, unless resulting in large defects, may particularly be difficult to identify on X-ray chest. The chest X-ray with NG tube insertion for upper GI Barium or Abdominal CT scan or Abdominal MRI has been found to be the best diagnostic tool. This may also show unilateral elevation of diaphragmatic dome, sub diaphragmatic densities & displacement of abdominal organs. Chest radiograph in diaphragmatic hernia may reveal nonspecific findings, like an arch like shadow of raised hemi diaphragm, extraneous densities above the diaphragm & mediastinal shifts to contralateral side and disc like atelectasis adjacent to raised diaphragm (Ragalie, G. F., & Kutty, K. 1984).

2. Ultrasound: ultrasound is now frequently used in early evaluation of trauma patients for free fluid in abdomen, chest or pericardium but an experienced operator may be able to visualize an injury to the diaphragm. A negative study does not exclude the diagnosis.

3. C. T. Scanning: CT scanning may be useful in detecting diaphragmatic injury and to rule out different diagnosis like pulmonary embolism, pneumonia, spontaneous pneumothorax etc. However, most of the patients with penetrating injury still don’t receive a correct preoperative diagnosis. The findings consistent with diaphragmatic injury such as “waist like constriction of abdominal visera i.e. collar sign”, intrathoracic herniation of abdominal visera & diafragmatic discontinuity may be recorded. The helical CT, especially the coronal & sagittal reformatted images is useful in the diagnosis of acute diafragmatic rupture after blunt trauma. Helical CT can detect 78% of Left sided & 50% of right sided injuries (Killeen, K. L. et al., 1999).

4. MRI: In most of the cases, a standard chest X-ray or CT may reveal the diagnosis, yet in some cases more subtle signs require careful analysis of CT images and MRI in some specific situations. MRI with breath hold permits good visualization of diafragmatic abnormalities, but the technique cannot be performed in an emergency situation (Iochum, S. et al., 2002).

5. Laparoscopy and Thoracoscopy: Some authors have advised to induce pneumoperitoneum being a safe & accurate diagnostic tool for differentiating diaphragmatic hernia from a paralyzed or eventuated diafragm. In diafragmatic hernia, the injected air will enter from peritoneum into the pleural cavity (Oh, K. S. et al., 1988). Thoracoscopy may be used to visualize the diafragm when the diagnosis of diafragmatic rupture is considered & in case laparotomy is not required to manage other injuries. Laparoscopy has a sensitivity of about 88% and a sensitivity of nearly 100% in evaluating for diafragmatic Injury (Leslie, V., & Burns, B. 2009). N. D’souza et al., further emphasized that diagnostic laparoscopy offers a diagnostic & therapeutic tool to prevent progression of occult traumatic injury to chronic diafragmatic hernias (D’Souza, N. et al., 2017). Right sided traumatic diafragmatic injury is a risk factor for morbidity & mortality.

Case 1  
This 42 years old male patient got admitted in our hospital with h/o of breathlessness on exertion since last 4yrs & hypertension 2yrs, for which he was on regular treatment with Tab Olmezest H80 mg OD. During Preanesthetic checkup, he disclosed a h/o fall 4yrs ago & hitting his right side of chest on a sofa couch & after that he used to feel discomfort on exertion. It was also revealed that the he had pneumonia at the age of 4yrs & had right 10th rib partial resection with ICD insertion for 4-5 months, but he did not respond the treatment & hence he switched over to some homeopathic medication & got recovered completely. In later life, the patient remained a marathon runner (12km) consecutive for 3yrs without any problem. He was a chronic alcoholic & used to ingest 350ml spirit every day, which he left since approx. 5 months ago. He was a tobacco, gutaka chewer and chain smoker. He used to get breathless off & on while dancing & exertional work for which he used to take rest in between.

Earlier, the patient got admitted at some other hospital for his fever of 102-103°F. His fever subsided with the treatment given but breathlessness still persisted, for which he underwent flexible bronchoscopy there, which revealed normal vocal cards, trachea & carina but there was an evidence of extrinsic compression over right middle and lower lobe. Hence C.T. Chest was advised, which revealed right sided diafragmatic hernia.

Now the patient was planned for progressive pneumoperitoneum to confirm the diafragmatic rupture. Preoperative his CBC, KFT, LFT, Blood sugar, serum electrolytes ABG, EKG & 2D ECHO all were found within normal limits. X-ray Chest (PA view) revealed right middle & lower zone opacification.

Pneumoperitoneum was performed ↓GA with spontaneous respiration by slow injection of 2 lit of gas
over 1/2hr period. The post pneumoperitoneum X-ray chest did not reveal any evidence of pneumothorax. A day after, the patient was posted for right diaphragmatic hernia repair.

Case-2

This 42yrs. old female patient was referred to our pre-anesthesia clinic from outpatient department of our hospital. She presented in OPD with c/o cough with expectoration since last 8 months, hypertension 6 months, hypothyroidism 5 yrs & breathlessness on exertion since last 5 months and the patient was on regular treatment.

During pre anaesthetic checkup she revealed that she had forceful projectile vomiting about 3½ yrs. ago with epigastric pain radiating to her back. Since then she was able to climb only one flight of stairs. Her past surgical history revealed the excision of her right breast fibroadenoma approx. about 11yrs ago under GA, which was uneventful.

On examination, her BP was 160/90mmg, HR 106/mt & Spo2 97% on room air. Chest auscultation revealed bilateral decreased breath sounds on the bases anteriorly & heart sounds appeared clinically normal with no murmur. Her CBC, blood sugar, KFT, urine examination, ECG all were within normal limits. 2D ECHO revealed LVEF 55% with normal study. X-ray chest PA view showed elevated right dome of diaphragm with gas shadows and area of fluid & air level. This raised the suspicion of abdominal viscera in right thorax. Hence the patient was advised CT chest, which revealed the herniation of fat, colon & duodenal loop in right thorax and confirmed the diagnosis of Rt. Sided Spontaneous Ruptured Diaphragmatic Hernia. The patient was recounseled & discussed about the pathology and was advised to get her hernia repaired at the earliest. She was also advised to continue her antihypertensive and thyroxine treatment till the time of surgery.

The patient took almost 3½ month to decide to undergo surgery. At the time of admission her BP was well controlled & there was no fresh complaint. Hence the patient was posted for her diaphragmatic hernia repair on the next morning.

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Fig. 1: X-ray chest PA view - elevated right dome of diaphragm with gas shadows and area of fluid & air level.
Fig. 2: CT Chest

Fig 2a

Fig. 2b

Fig 2c
Anaesthetic Management

The surgeon took case 1 for progressive pneumoperitoneum under GA as described in case report, which turned out to be negative for pneumothorax, while in case 2, the surgeon deferred the procedure & decided to take the patient for surgical correction on CT finding.

In case 1, the diaphragmatic defect was repaired through thoracoabdominal approach & for which tracheal intubation was done with left sided medium size Robertshaw DLT. In case 2, the surgical repair was done through epigastric & right subcostal incision, for which single lumen endotracheal intubation was performed. NIBP, ECG, pulse oximetry, ECCO₂, urine output, temperature & wide bore IV cannula were instituted before induction of General anaesthesia.

During the surgical procedure, in case 1, the diaphragmatic rupture was identified in the posterior half of the diaphragm whereas in case 2, the diaphragmatic rupture was identified in anterior half of the diaphragm.

The hernial contents found in case 1 were omentum, right sided colon & part of right lobe of liver & in case 2 were omentum, Tr colon & stomach were reduced into the abdominal cavity and the diaphragmatic defect was repaired by primary closure with silk and marlex mesh reinforcement was done. ICT was inserted & kept in situ.

The total duration of surgical correction of right sided diaphragmatic hernia lasted for 3-3.30hrs in both the cases.

Anaesthetic technique in both the cases more or less was similar as induction of Gen. Anaesthesia was initiated with pre oxygenation with 100% for 5 min. Inj. Midazolam, fentanyl propofol/thiopental, O₂ & N₂O, sevoflurane and intubation was facilitated with suxamethonium. The endo tracheal tube was properly secured in situ & ointment was applied to the both eyes & closed with tape. Anesthesia was maintained with O₂, N₂O, Isoflurane & vacuroneum, fentanyl, dexmededitomidine & IPPV with circle absorber. At the end of surgery before the skin closure, the wound was infiltrated with Bupivacaine 0.125% 20-30ml for post of analgesia. The residual muscle relaxant effect was neutralized with injection Glycopyrrolate & Neostigmine. Both the patients were extubated on the table & shifted to the ICU for post-operative monitoring & observation for 48hrs. In ICU, inj. dexmedetomidine infusion was started @ 0.3 – 0.4 mcg/kg/hr, injection diclofenac & paracetamol 1000mg every 6 hrs. for postoperative pain management. O₂ was supplemented with Venturi mask @ 6 lit/min. Both the patient. made satisfactory recovery in ICU & after 48hrs the patients were shifted to room.

DISCUSSION

Bochdalek hernia is usually most common congenital deformity due to the failure of closure of Pleuroperitoneal ducts during 4th & 12th weeks of gestation with an incidence 1:4000 live births (Kapur, B., & Thomas, S. 1991; & Gale, M. E. 1985) ranging from 1:2200-1: 12,500 live births (25,5). The majority of these cases are presented during neonatal life with respiratory distress but rarely due to posterolateral congenital diaphragmatic defects. Small Bockdalek’s hernias remain asymptomatic and undiagnosed until childhood (Gale, M. E. 1985; & Mar Fan, M. J. et al., 1999).

It can however be acquired in adulthood due to the reopening of coronary ligaments as a result of trauma. In adults, the clinical presentation of Bochdalek hernia is rare and usually asymptomatic & incidentally detected on x-ray chest & CT scan. The incidence is only about 1% of all the diaphragmatic hernias. It may be left or right hemidiaphragmatic (Kearney, P. A. et al., 1989; & George, L. et al., 2000) (right sided being rare approx. in 10-20% only) or bilateral diaphragmatic hernia (Mullins, M. E. et al., 2001). El Nakadi, B., & Vanderhoeft, P. 1990 reported a case of bilateral diaphragmatic rupture in 23 yrs. old female. There are fewer than 100 cases of Bochdalek hernia reported in adults. The right sided Bochdalek hernia in adult is an extremely rare entity with less than 20 of such cases
have been reported in the literature earlier (Rout, S. et al., 2007; & Sharma, B., & Gupta, D. 2018). Further, only 12 articles describing adult right sided Bochdalek hernia containing colon requiring surgery have been reported in the literature. These two more cases of right sided spontaneous delayed diaphragmatic hernia have been reported in the literature.

The symptomatic adult Bochdalek hernias are usually left sided, possibly due to caudate lobe of liver compressing right pleuroparietoneal canal & thus prevent right sided herniation (Kanazawa, A. et al., 2007; & Kumar, A. et al., 2009). This may also be due to the fact that right hemi diaphragm being fully developed & formed embryologically before the left side (Kanazawa, A. et al., 2007; & Losanoff, J. E., & Sauter, E. R. 2004). Interestingly, right sided Bochdalek hernias are rarely symptomatic as the defect is usually larger than left sided defect (Killeen, K. L. et al., 1999).

Frank Edwin & Mark in 2009 suggested/proposed that the use of term spontaneous to describe diaphragmatic hernias is a misnomer & diverts the clinician’s attention from clinical recognition of antecedent (Peparipitating) factors that may raise the clinician index of suspicion. Hence, this entity should be best described as “Effort Diaphragmatic Rupture”. These two reported cases of right sided diaphragmatic hernia are in consistence with this definition. In delayed diaphragmatic hernia cases, the time interval between the trauma & presentation ranges from 2 weeks to 40 years (Lin, Y. K. et al., 1999). Both the cases (I & II) presented in our outpatient department with the chief c/o breathlessness on exertion 4 yrs. & 3.9 yrs. after their initial (original) episode of blunt trauma hitting right side of his chest & forceful projectile vomiting respectively. Grimes in 1974 (Matevych, O. Y. 2008; & Jain, P. et al., 2009) classified the diaphragmatic rupture depending on the presentation time as –

a. Acute --- when the presentation & diagnosis is made at the time of injury.

b. Delayed – when the presentation & diagnosis is made after an interval of time since the original injury.

c. Chronic--- when the presentation & the diagnosis is made with symptoms of visceral incarceration due to the associated herniation of abdominal contents into thorax.

According to this classification, both these cases may be classified into “delayed” type of acquired (spontaneous) diaphragmatic hernia.

The diaphragmatic injuries may either be Penetrating due to direct trauma or blunt due to Indirect trauma, causing the diaphragmatic hernias. The direct penetrating injuries to the diaphragm is more common in about 2/3 of cases, whereas the rest 1/3 injuries may be due to blunt trauma e.g. motor vehicle crashes/accidents in young men (Shah, R. et al., 1995). D’souza & Clarke (2017) reported the mean age of 30yrs & the majority (92.4%) of the patients are male in traumatic diaphragmatic injuries.

The diaphragmatic injury is usually accompanied by other injuries, which indicate that more severe trauma might have occurred. The injury to the left hemi diaphragm occurs three times more frequent than the injuries to right hemidiaphragm following blunt trauma. The case 1 had blunt trauma on right side of his chest by hitting a sofa couch.

The penetrating injuries tend to be smaller in size measuring less than 2 cm and as a result of this, these injuries are more likely to be occult & frequently result in delayed diagnosis. The blunt trauma more commonly causes left diaphragmatic hernia possibly due to the buffering effect of the liver on the right hemi diaphragm, which distributes the pressure evenly over the diaphragmatic surface (Shanmuganathan, K. et al., 2000). However, the relative paucity of Rt. sided injuries may also have been associated with under diagnosis (Killeen, K. L. et al., 1999). The impact of injuries occurring from lateral sides of the chest will cause the distortion of the chest wall & shears the diaphragm (as occurred in case 1), whereas a direct front injury will lead to increase in intra-abdominal pressure (Shanmuganathan, K. et al., 2000).

The spontaneous rupture of diaphragm leading to spontaneous acquired diaphragmatic hernia without any apparent h/o trauma is further more rare entity to occur e.g. parturition (Watkin, D. S. et al., 1993), violent projectile vomiting (George, L. et al., 2000), stranuous physical exercise or dancing (Bisgaard, C. et al., 1985) etc. Both the reported cases had no apparent h/o blunt trauma. Case 1 had fallen on sofa couch while the case 2 had forceful projectile vomiting & later both the cases developed breathlessness on exertion. In addition case 2 used to have radiating pain in the back as well.

The symptoms in adults due to the injury/trauma depend on the site & type of injury causing the diaphragmatic defect, time of presentation after the injury or initial episode & the herniated abdominal viscera e.g. stomach, liver, omentum, bowel or colon etc. The case 1 had omentum, right Colon, right lobe of liver whereas the case 2 had omentum, transverse colon & stomach as the hernial contents. The diagnosis is delayed from months to years after the initial injury or episode. The symptoms are generally less severe, vague & intermittent in nature but can present acutely with constant & specific symptoms relating to GIT. Although respiratory symptoms are less common, yet may be due to the reduction in chest cavity volume/capacity. The respiratory symptoms may include shortness of breath, dyspnoea, orthopnoea, chest pain or referred pain to shoulder or in the back.
Right sided Bochdalek hernia patients may present to an emergency department with c/o dyspnoea or acute abdominal pain (may be due to acute intestinal obstruction) to be investigated with X-ray chest & CT scanning (Agrafiotis, A. C. et al., 2011; & Kanazawa, A. et al., 2002). To diagnose spontaneous (effort) delayed rupture of diaphragm poses a great difficulty to the physician & radiologist as well. It may be difficult to interpret on X-ray chest because it can easily be missed & confused with pneumothorax or pleural effusion in adults resulting from an increase in abdominothoracic pressure gradient during any stranuous physical activities.

A delay in early diagnosis & treatment of diaphragmatic hernia cases may cause an increased morbidity & mortality in these patients. Salacín S et al., reported a case of delayed Bochdalek hernia in adult leading to death was first diagnosed at Medico legal autopsy (Salacín, S. et al., 1941; & Bisgaard, C. et al., 1985) reported an adult case with 4 months’ delay in diagnosis of spontaneous rupture of left hemidiaphragm as a result of physical exercise. De Alwisk et al., reported a case of sudden death in an adult nontraumatic diaphragmatic hernia, which developed due to undiagnosed congenital diaphragmatic hernia (CDH), though very rare occurrence (DeAlwiss, K., & Mitsunaga, E. M. 2009). Barclay-Buchanan, C. J., & Herzog, E. S. (2017) reported 69 yrs. old patient who presented to an emergency department with dyspnea after Valsalva maneuver for chronic constipation. On investigation, CT scan showed a large anteromedial diaphragmatic rupture with herniation of stomach, small intestine & colon into right hemi thorax & the patient died within 24 hours. Both the cases presented were managed successfully & had uneventful recovery in post-operative period & during their stay in the hospital & were discharged in satisfactory conditions.

**CONCLUSION:**
The signs & symptoms in an adulthood Rt. sided diaphragmatic hernia are vague & nonspecific. Awareness of this rare entity & recognition of various precipitating factors like stranuous physical activities or any thoraco abdominal trauma leading to surgical intervention or any violent effort conditions leading to an increase in thoracoabdominal pressure gradient are the first step towards the diagnosis in patients with effort or nontraumatic diaphragmatic rupture. Therefore, such patients require a careful & thorough H/o past such ailment during preoperative assessment which may help in differentiating some diagnosis & conclusion.

The diagnosis in such patients is not easy in an emergency department & also poses a great challenge to physician & radiologist as well, especially when the tear is small or nontraumatic. The diagnosis is often delayed. Hence, a very high index of suspicion of diaphragmatic rupture to be kept in mind in such patients. The importance of plain X-ray chest with N.G. tube in situ may highlight & alert the possibility of diaphragmatic rupture. Further, an early acquiring CT scan or MRI is warranted when dealing with unexplained symptoms in spontaneous diaphragmatic rupture to reduce the morbidity & mortality.

**Financial support & sponsorship:** - NIL.

**Conflicts of Interest:** There is no conflicts of interests.

**Acknowledgment:** The authors are highly grateful & appreciated Mrs. Neeru Sehgal for her sincere assistance & untiring support in typing this manuscript to generate this article in presentable shape.

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