Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/15095
DOI URL: http://dx.doi.org/10.21474/IJAR01/15095

RESEARCH ARTICLE

COMPARATIVE TREATMENTS OF EMPYEMA

Dr. Amitabh Verma
Assistant Professor, Department of Cardio Thoracic Surgery, Patna Medical College, HospitalB/43, Housing Colony, Kankarbagh, Patna-20.

Manuscript Info

Manuscript History
Received: 29 May 2022
Final Accepted: 30 June 2022
Published: July 2022

Key words:-
Empyema, Thoracotomy, Thoracoscopic Surgery

Abstract

Empyema the collection of pus in pleural cavity. It's caused by an infection and can cause symptoms such as pain and shortness of breath. The study was based on 50 patients admitted to the hospital in the time period of 2 years. The different treatment methods used on the patients were Fluid removal by chest tube, a thoracotomy or by performing thoracoscopic surgery. For high-risk patient chest tube drain with repeated pleural toilet in operation theatre saved 90% patients from Decortication surgery.

Introduction:-

Empyema is a frequent clinical problem worldwide. It is a health condition that affects the space between the outermost layer of the lungs and the inner lining of the chest wall, known as the pleural space [3] [1]. It is a condition where the patient has pus between the lung and the membrane surrounding it [2].

It's caused by an infection and can cause symptoms such as pain and shortness of breath. One can get empyema through bacterial or fungal infections. Bacteria, such as Streptococcus aureus and Pseudomonas, which are particularly common if the patient is infected at the hospital [4]. Getting empyema through Streptococcus aureus is particularly common if the patient had surgery or trauma. The most common type of fungus associated with this kind of infection is the Candida species [8]. The different treatment methods used are Fluid removal by chest tube, a thoracotomy or by performing thoracoscopic surgery. Empyema has substantial morbidity and mortality.[1] [14]

The objectives of this study were to identify the clinical, surgical and microbiological features, and management outcomes, of empyema [6]. The treatment of an empyema entails removing the fluid and treating the underlying process. The treatment also includes protracted courses of various single and multiple antibiotics [5].

There are 3 stages of empyema:

1. Exudative stage
2. Fibrinopuratenal stage
3. Organizing phase

An empyema develops 4-6 weeks after the onset of aspiration of bacteria into the lungs.

Usually, Decortication surgery is the last resource. The main goal of surgical therapy in empyema is the evacuation of the pus from the pleural cavity and lung expansion[15] In patients requiring surgical intervention in acute empyema, thoracotomy is the first step.[12]

Corresponding Author:- Dr. Amitabh Verma
Address:- Assistant Professor, Department of Cardio Thoracic Surgery,Patna Medical College, HospitalB/43, Housing Colony, Kankarbagh, Patna-20.

Methodology:-

Study design: A retrospective study of patients in the age group of 10 to 75 years, with empyema presenting over a period of 02 years (2019-2021).

50 Patients were identified for the study. The case definition of empyema in the patients were the presence of pus or other evidence of active infection in the pleural cavity [9].

The symptoms included:

1. Chest pain- which worsen on deep breathing
2. Dry cough
3. Excessive sweating
4. Fever
5. Shortness of breath
6. Weight loss

Investigation:

Clinical and radiological diagnosis were done by CT thorax and X ray chest [5] [1]. Following information were obtained and recorded: patient data, medical and surgical history, clinical characteristics, presence of underlying risk factors, data from investigations (imaging, microbiology, biochemistry, serology, haematology, liver and renal function tests) medical and surgical treatment, antibiotic usage. The outcomes of management were recorded.

Treatment of empyema included:

1. Antibiotic usage
2. Drainage by inserting chest tube
3. Surgery for advanced cases: Decortication surgery was done for those patients who showed no improvement in the first 72 hours after chest tube drain and repeated pleural toilet.

At the centre 90% patient were treated either with chest drain or Decortication surgery[14 Tube thoracostomy is the most common type of procedure used at the centre, in which bigger tubes are associated with more pain. For this reason, small tubes are frequently placed, generally smaller than 14F. The position of the tube should be confirming with an x-ray or CT scan [5]. Lack of clinical improvement in the first 72 hours was usually related to tube malposition or blockage. Blockage of the chest tube was prevented by with frequent flushing. Any indication of a persistent fluid or other locations was addressed with more aggressive therapy including a larger tube, more tubes, or surgery. The chest tube was removed when the daily production of pleural fluid was almost negligible along with clinical and radiological improvement.

In the first sitting the chest drain was inserted in 5^{th} intercostal space in triangle of safety. After pus was drained, 50 ml normal saline flushed inside chest drain under proper aseptic precautions. During the proceedings saturation is measured along with other discomfort to the patient. After discharge were routinely followed up. None of the patient complained of any discomfort and symptoms like fever and cough. CT thorax was done in selected case which showed no significant finding.

For high-risk patient when the pus was in liquid state chest drained repeated pleural toilet in operation theatre saved many patients from Decortication surgery in which restrictive layer of fibrous tissues overlined the lung and chest was removed by fine dissection under general anaesthesia [7]. After surgery expansion of lung was checked in operation theatre with the help of anaesthetist.Only in 10%cases Decortication surgery was done.

Risk of operative treatment:

1. Bleeding
2. Prolonged air leak
3. Injury to nerves, Pericardium and Diaphragm
4. Respiratory failure

Discussion:-

Empyema is associated with elevated morbidity and mortality, around 20% to 30% of patients affected will either die or required further surgery in the first year after developing empyema. Early intervention is crucial in the management of empyema.[1][2]. Most empyema follows bacterial pneumonia or unevacuated haemothorax following trauma.The key is early treatment before the onset of trapped lung. Thrombolytic therapy only works for early empyema but even when it works, a complete resolution is not always possible. A thoracic surgery consult should be made early; if the pleural cavity is emptied of all the fluid/blood, the risk of an empyema is low. However, if there is a delay in treatment, the patient may end up needing VATs or a thoracotomy [12][16]. Patients with empyema usually have a chest tube and are monitored by nurses on the surgical floor. The prognosis for most patients with early empyema is excellent. However, complete resolution of the X-ray findings may take months. The pulmonary function usually improves rapidly once empyema is surgically managed.[10][11][12].

Conclusion:-

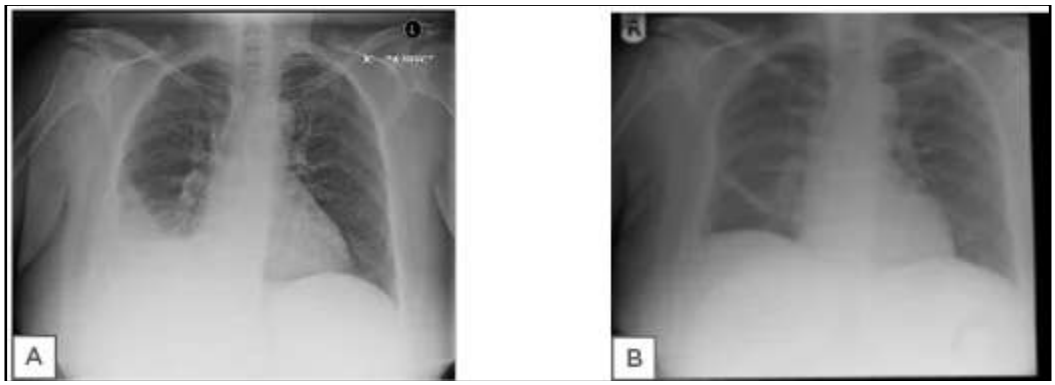

Figure1:- (A) Preoperative and (B) Post operative X-Ray after Decortication Surgery.

In the study Chest tube drain with pleural toilet showed better result in child, elderly and immune compromised patients. Out 50 patients, 2 cases developed minor wound infection which was treated by aseptic dressing and IV antibiotic. All 50 patients were discharged in 3 to 4 weeks after surgery. They were followed post operatively for 6 months having no previous complain like fever, cough and shortness of breath. It can be concluded that for high-risk patient chest tube drain with repeated pleural toilet saved 90% patients.

References:-

1. Lee SF, Lawrence D, Booth H, Morris-Jones S, Macrae B, et al. (2010) Thoracic empyema: current opinions in medical and surgical management. Curr Opin Pulm Med 16: 194–200.
2. View ArticleGoogle Scholar
3. 2.Christopoulou-Aletra H, Papavramidou N (2008) “Empyemas” of the thoracic cavity in the Hippocratic Corpus. Ann Thorac Surg 85: 1132–4.View ArticleGoogle Scholar
4. Chen W, Lin YC, Liang SJ, Tu CY, Chen HJ, et al. (2009) Hospital-acquired thoracic empyema in adults: a 5-year study. South Med J 102: 909–14. View ArticleGoogle Scholar
5. Ferguson AD, Prescott RJ, Selkon JB, Watson D, Swinburn CR (1996) The clinical course and management of thoracic empyema. QJM 89: 285–9.
6. Maskell NA, Batt S, Hedley EL, Davies CW, Gillespie SH (2006) The bacteriology of pleural infection by genetic and standard methods and its mortality significance. Am J Respir Crit Care Med 174: 817–23.
7. Ahmed RA, Marrie TJ, Huang JQ (2006) Thoracic empyema in patients with community-acquired pneumonia. Am J Med 119: 877–83.
8. Foster S, Maskell N (2007) Bacteriology of complicated parapneumonic effusions. Curr Opin Pulm Med 13: 319–23.
9. Meyer CN, Rosenlund S, Nielsen J, Friis-Moller A (2011) Bacteriological aetiology and antimicrobial treatment of pleural empyema. Scand J Infect Dis 43: 165–9.
10. Bostock IC, Sheikh F, Millington TM, Finley DJ, Phillips JD. Contemporary outcomes of surgical management of complex thoracic infections. J Thorac Dis. 2018 Sep;10(9):5421-5427. [PMC free article] [PubMed]

11. van Roozendaal LM, van Gool MH, Sprooten RTM, Maesen BAE, Poeze M, Hulsewé KWE, Vissers YLJ, de Loos ER. Surgical treatment of bronchial rupture in blunt chest trauma: a review of literature. J Thorac Dis. 2018 Sep;10(9):5576-5583. [PMC free article] [PubMed
12. Touray S, Sood RN, Lindstrom D, Holdorf J, Ahmad S, Knox DB, Sosa AF. Risk Stratification in Patients with Complicated Parapneumonic Effusions and Empyema Using the RAPID Score. Lung. 2018 Oct;196(5):623-629.
13. .Höfken H, Herrmann D, Ewig S, Volmerig J, Hecker E. Video-Assisted Thoracoscopic Surgery of Parapneumonic Empyema - a 10-year Single-Centre Experience. Pneumologie. 2018 Dec;72(12):843-850. [PubMed]
14. 26.Khwaja S, Rosenbaum DH, Paul MC, Bhojani RA, Estrera AS, et al. (2005) Surgical treatment of thoracic empyema in HIV-infected patients: severity and treatment modality is associated with CD4 count status. Chest 128: 246–9.
15. 33.Cardillo G, Carleo F, Carbone L, Di MM, Salvadori L, et al. (2010) Chronic postpneumonic pleural empyema: comparative merits of thoracoscopic versus open decortication. Eur J Cardiothorac Surg 36: 914–8.
16. 34.St Peter SD, Tsao K, Spilde TL, Keckler SJ, Harrison C, et al. (2009) Thoracoscopic decortication vs tube thoracostomy with fibrinolysis for empyema in children: a prospective, randomized trial. J Pediatr Surg 44: 106–11.
17. 35.Tong BC, Hanna J, Toloza EM, Onaitis MW, D'Amico TA, et al. (2010) Outcomes of video-assisted thoracoscopic decortication. Ann Thorac Surg 89: 220–5.