

**Original Research Article**

An Experimental Study the Usefulness of Computed Tomography (CT) in Management of Empyema in Central India

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Email: shobhitakmane@gmail.com**Abstract**

Background: *The main objective of the present study to investigate the utilization of computed tomography in empyema.*

Research Design: *The current study used the experimental research design in surgical intervention of their physical problems.*

Sample and Sampling Technique: *In the present study purposive sampling technique was used, total 55 samples were selected in inpatient pediatric surgery department in NSCB medical college and hospital Jabalpur MP, India.*

Method: *The purposive patients for pleural effusion documented to have clinical and laboratory evidence of empyema, these patients were investigated with the contrast enhanced computed tomography of chest, preferably on admission. Patient's decision was taken on the basis of personal consent and clinical status.*

Statistical Analyses: *The present study was used in descriptive and observational analyses technique for the purpose of study.*

Result: *Findings of the present study suggested that the 27(49%) patients were male and 28 (51%) were females. CT stage and it suggests that early drainage intervention having no failure 28 (100%) patients than the late drainage was only 6 (66%) cases improve out of 27 cases.*

Conclusion: *The finding of present study is concluded that the CT scan is uses on high utility in late empyema, CT scan are more useful in late empyema were pleural thickening, thick loculations are common and will be easily underestimated on sonography.*

Keyword: *empyema, Computed tomography.*

Introduction

The empyema thoracic is defined as a pleural space suppurative fluid collection. Pleural space

infections may complicate thoracic injury or arise secondary to a subjacent pneumonia. In the pediatric population, para-pneumonic effusion is

the most frequent etiology for empyema.¹The American thoracic society delineates three progressive phases of empyema: an early exudative phase, an intermediate fibrin purulent phase and a late organizing phase².

The incidence of the empyema in children is increasing worldwide. While there are emerging data for the best treatment options, there is little evidence to support the imaging modalities used to guide treatment, particularly with regard to the role of routine CT scanning; our study is a baby step toward future to fulfill the lacuna in this area.

Objective

The main objective of the present study to investigate the utilization of computed tomography in empyema.

Research Design

The current study used the experimental research design in surgical intervention of their physical problems.

Sample and sampling technique

In the present study purposive sampling technique was used, total 55 samples were selected in inpatient pediatric surgery department in NSCB medical college and hospital Jabalpur MP, India.

Method and Procedure

The present study was conducted in pediatric surgery unit of department of surgery, NSCB, Medical College, Jabalpur, Madhya-Pradesh, India. All the purposive patients for pleural effusion documented to have clinical and laboratory evidence of empyema, these patients were investigated with the contrast enhanced computed tomography of chest, preferably on admission. Patient's decision was taken on the basis of personal consent and clinical status. Uses of antibiotics, supportive care system, oxygen, AKT and others measures were done as per standard international recommendations.

Statistical Analyses

The present study was used in descriptive and observational analyses technique for the purpose of study.

Result

Findings of the present study suggested that the 27(49%) patients were male and 28 (51%) were females. The age group ranged from 4 months to 13 years. Majority of the patients were anemic and have poor nutritional status. Mean hemoglobin was 8.8gm. Mean days of history of severe symptoms suggestive of empyema was 9.20±2.3 days.

Table no.1 shows the distribution of patients according to the modality of interventions

Modality of intervention	N=55
Drainage	25 (45%)
Primary open decortications	8 (14%)
Secondary open decortication	8 (14%) 4 VATS failure
Primary VATS	6(11%)
Secondary VATS	8 (14%)

Table no. 1 indicates that most of the patients underwent drainage as the definitive mode of treatment 25 (45%). Another finding such as CT chest was noted under the following heads-collapse, density of collection, pleural enhancement, and peel thickness: visceral and parietal, loculations, lung parenchymal description.

Table no.2 shows the failure rate of various procedures with respect to CT stage

Modality of intervention done	Early (28)	Late (27)
Drainage group (34)	28 (no failure)	6(4 failed) 66 %
VATS group (16)	0	16 (7 failed) 43%
Open decortication group (16)	0	16 (0% failure)

Table no.2 shows the failure rate of various procedures with respect to CT stage and it suggests that early drainage intervention having no failure 28 (100%) patients than the late drainage were only 6 (66%) cases improve out of 27 cases.

Discussion

The present study confirms the findings of late presentation and poor general and nutritional status of patients as found in developing world. This is unlike the western data, where most of the patients have early presentation and are not extremely compromised physiologically.⁴ Thus the need of defining the protocols of investigation and treatment has to be reviewed in developing world.^{7,5}

The categorization of patients is traditionally done on the basis of clinical, laboratory and radiological findings. While there are emerging data for the best treatment option, there is little evidence to support the imaging modalities used to guide treatment, particularly with to the role of routine CT scanning.³ The western trials suggest that there is no role for the routine use of CT scanning in children if treated with urokinase and percutaneous chest drain.

The most common successful modality of treatment adopted in western world is percutaneous drainage and fibrinolysis which is obviously justified in early cases. In the present study decortication was needed in 29% cases which are justified by late presentation. There is need of investigation which can detect late cases in our setup.

As per the available literature, CT characteristic of parapneumonic effusion do not allow radiologist to accurately predict empyema. The presence or absence of such CT finding should not influence therapeutic decision concerning the management of parapneumonic effusion.⁶ An attempt to correlate the CT findings with changes in the pleura and subcostal tissues with the clinical empyema stages I-III, according to light, showed that CT was unable to distinguish between early and late empyema.⁹

Unfortunately most of the studies were done in western countries where the presentation of empyema is early. The advantage of CT scan are more useful in late empyema where pleural thickening, thick loculations are common and will be easily underestimated on sonography. Late empyema are characterized typically on CECT

chest as presence of loculations, high density pus, pleural thickening.

It is clear from the observation in the past that, CT is more closer to actual stages of empyema in accuracy, in comparison to US which under stage the disease(Dissertation, Dr. Hemant Namdeo, 2008-2009 in NSCB, medical college and hospital, Jabalpur, MP, India), CT examination also enables the position of the empyema, the depth of the callus surrounding it, the position of drains and the relation between the visceral pleura and the pulmonary parenchyma and their demarcation to be determined prior to open surgery with greater precision than by any other diagnostic technique developed previously.⁸

Conclusion

The finding of present study is concluded that the CT scan is used on high utility in late empyema, CT scan are more useful in late empyema where pleural thickening, thick loculations are common and will be easily underestimated on sonography.

Conflict of interest- Authors are declaring that no conflict of interest.

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