CLUBE DE REVISTA
SERVIÇO DE CIRURGIA TORÁCICA

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PORTO ALEGRE, JUNHO 2009

ROTEIRO DE LEITURA CRÍTICA

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THE ANNALS OF THORACIC SURGERY

Annals of Thoracic Surgery

Editor(es) Científico(s):
Society of Thoracic Surgeons
Southern Thoracic Surgical Association
Área(s):
Cardiologia. Doenças Cardiovasculares
Cirurgia
Pneumologia
Tipo de Material: ***Periódicos com texto completo***
Forma de Aquisição: ***Assinado***
Analisado JCR 2006: ***sim*** Fator de Impacto: ***2,342*** (JCR-2006)
Número de citações: ***23.645***
Editor/distribuidor: ***Science Direct Online*** ISSN: ***0003-4975***
Período disponível: ***1995*** - ***presente***

GENERAL THORACIC SURGERY:
The Annals of Thoracic Surgery CME Program is located online at http://cme.ctsnetjournals.org. To take the CME activity related to this article, you must have either an STS member or an individual non-member subscription to the journal.

Choice of First Intervention is Related to Outcomes in the Management of Empyema

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(Ann Thorac Surg 2009;87:1525–31)

Base teórica

- Empiema pleural é historicamente desafiador
- Mortalidade de cerca de 15%

Base teórica

- Alternativas terapêuticas:
  - Antibioticoterapia;
  - Toracocentese;
  - Cateter pigtail;
  - Fibrinolíticos;
  - Drenagem pleural

  - VATS
  - Toracotomia

Delineamento

- Coorte retrospectiva de 2 centros (VA Medical Center e Miami Valley Hospital)

Critérios de seleção

- Todos os pacientes identificados com empiema por revisão de descrições cirúrgicas, banco de dados da microbiologia e notas de alta com o referido diagnóstico.
- 2000 – 2006.

- Incluído empiema classe: I, IIA e IIB

- Excluídos empiema classe III

Definições

- Empiema:
  - Estágio I: líquido livre, fluido, pH >7,3
  - Estágio IIA: fibrino-purulento, com loculações, sem ou mínimo encarceramento pleural, pH <7,1
  - Estágio IIB: fibrino-purulento, com loculações, encarceramento pleural considerável e pH<7,1.

Table 1. Clinical Data

Variable	Result No. (%), or Mean ± SEM
Patients	104
Miami Valley Hospital	54
VA Medical Center	50
Age, y	55.7 ± 1.4
Gender	
Male	85 (82)
Female	19 (18)
Smoker	57 (55)
Pack-years smoking	28.3 ± 3.6
Alcohol abuse	40 (38)
Drug abuse	22 (21)
Malignancy	18 (17)
Delay, d[a]	14.5 ± 1.7
APACHE II score	9.5 ± 0.5
KPS, %	60.5 ± 1.9
CCI	2.7 ± 0.2
White cell count, $\times 10^3/\mu L$	16.4 ± 0.8
Serum albumin, g/dL	2.8 ± 0.07
Loculations on chest CT scan	46 (43)
Pleural fluid analysis	
Level of pH	6.89 ± 0.07
White cell count, $\times 10^3/mm^3$	66.2 ± 17.9
LDH, $\times 10^3$ IU/L	5.6 ± 1.2
Glucose, mg/dL	28.0 ± 4.9
Gram-stain positive	37 (35)
Stage[b]	
I	15 (16)
IIA	22 (24)
IIB	56 (60)

[a] Time in days from first symptom(s) to thoracic surgical consultation. [b] Stage I = free fluid, pH >7.3; IIA = pus ± loculations, no peel, pH <7.1; IIB = pus ± peel, pH <7.1; 11 patients could not be staged from information available.

APACHE = Acute Physiology and Chronic Health Evaluation; CCI = Charlson comorbidity index; CT = computed tomography; KPS = Karnofsky performance status; LDH = lactate dehydrogenase; SEM = standard error of the mean; VA = Veterans Administration.

Intervenções

- Revisão de prontuário

Desfecho

- Variáveis: dados demográficos, estado clínico, radiografias e tomografias, análise de líquido pleural, tempo de intervalo até o tratamento, tipo de tratamento

- Desfecho: sobrevida, resolução do empiema, complicações e tempo de internação

Desfecho

- Procedure success: reexpansão pulmonar por radiograma, ausência de sepse, ausência de procedimentos adicionais.

- Overall all treatment success: ausência de mortalidade, ausência de novo procedimento

Questionamento

- A escolha do primeiro método para intervir em empiema classe I, IIA e IIB tem efeito sobre taxa de resolução, mortalidade, tempo de internação e complicações.

Erros sistemáticos

- Viés de seleção (atraso no tto)
- Viés de aferição (prontuários)
- Viés de confusão

Erros aleatórios

- Erro alfa
- Erro beta

- Análise univariada: teste t para variáveis contínuas e teste exato de Fisher para variáveis discretas.
- p alfa corrigido para múltiplas comparações pelo método de Bonferroni

- Análise multivariada incluiu regressão logística tendo como variáveis dependentes morte e falha do procedimento

Resultados

Table 2. Microbiology and Bacteriology Characteristics

Organism Cultured	Patients, No.
Streptococcus spp	
S pneumonia	6
S anginosus	14
S intermedius	4
S constellatus	2
α-Hemolytic	4
Others	3
Enterococcus	7
Staphylococcus spp	
S aureus	10
Methicillin-resistant	13
Coagulase negative	8
Corynebacterium	4
Citrobacter freundii	1
Klebsiella	3
Escherichia coli	3
Proteus	2
Serratia	2
Acinetobacter	2
Pseudomonas aeruginosa	2
Bacteroides	1
Mycobacterium avium intracellulare	1
Trichosporon	1
Nocardia	1
Candida spp	3
Actinomyces	1
>1 organism	13
No growth	21
Total	121

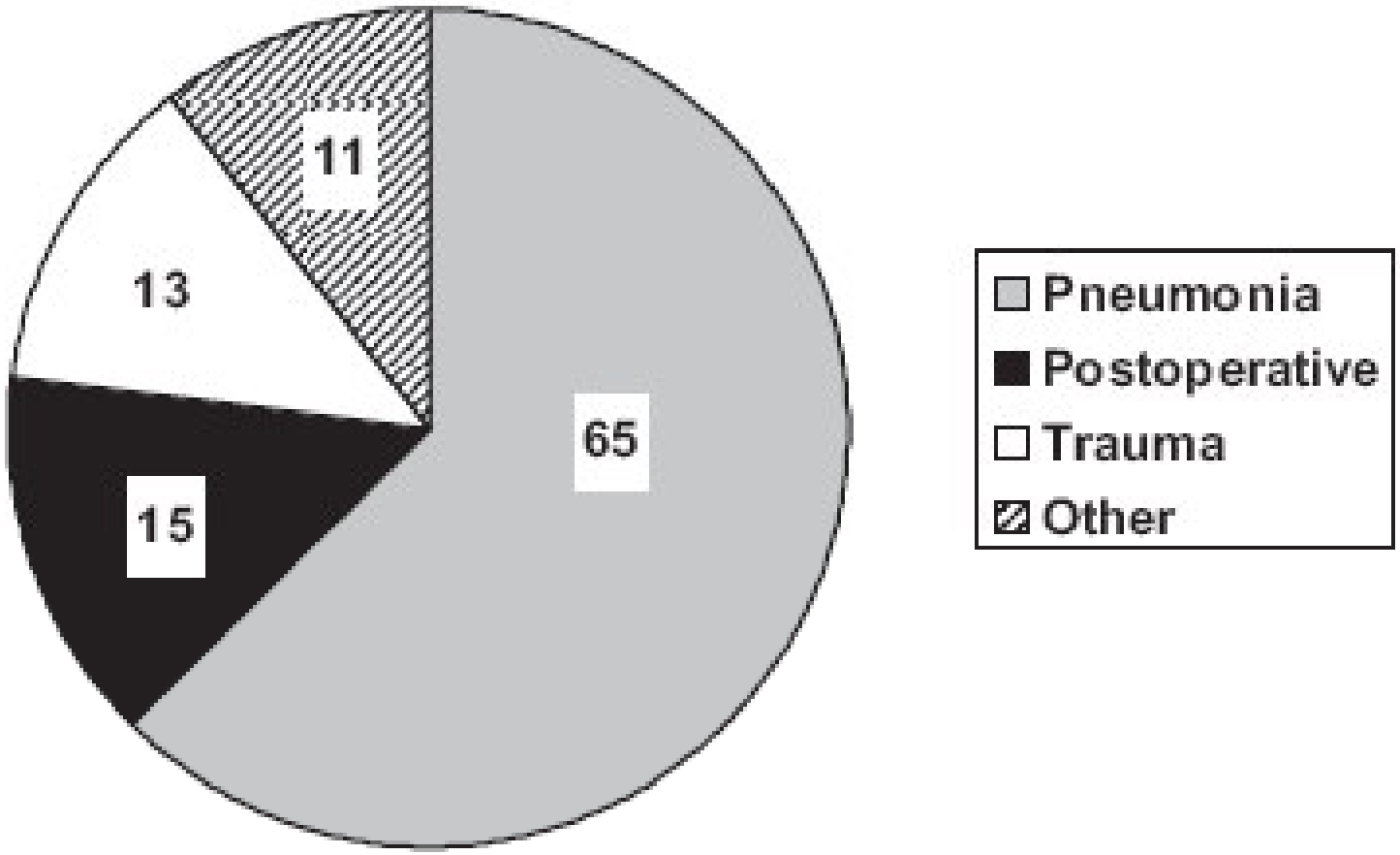


Fig 1. Causes of 104 cases of empyema. (Gray slice = pneumonia; black slice = postoperative; white slice = trauma; striped slice = other causes.)

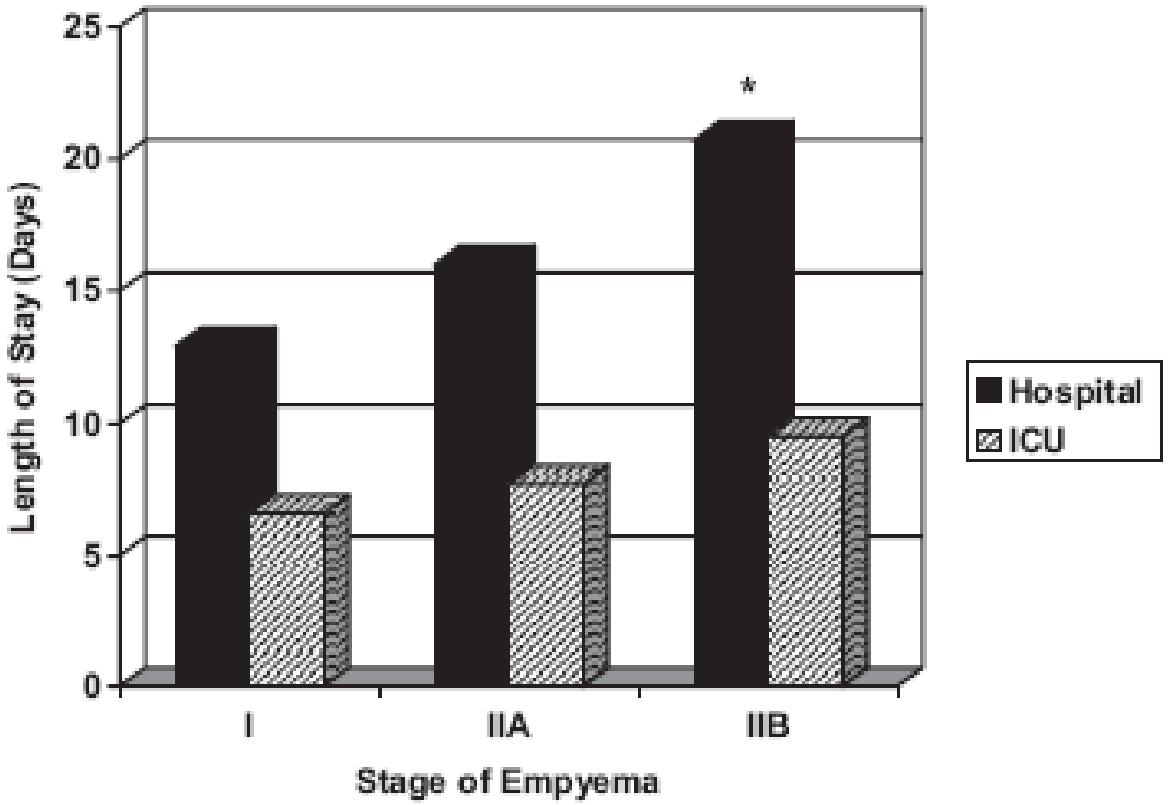
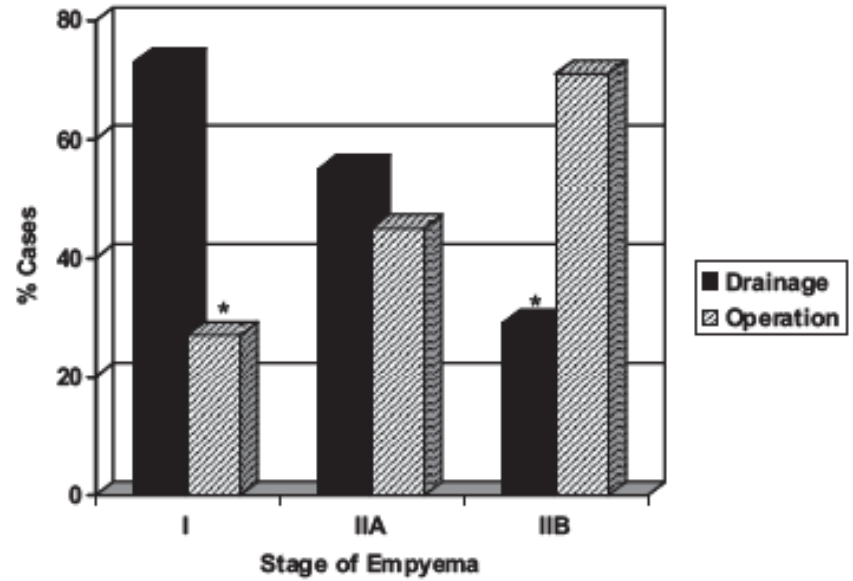
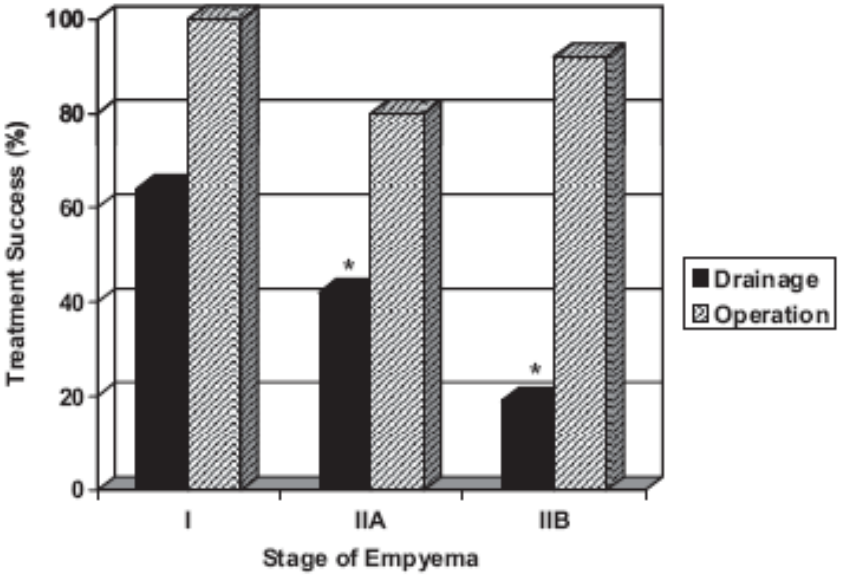


Fig 2. Length of stay in the hospital (black bars) and intensive care unit (ICU, striped bars) by clinical stage of empyema. Stage could be evaluated in 93 of 104 patients with empyema. (Stage I = free flowing fluid, no loculations, n = 15; stage IIA = pus and loculations, but no peel, n = 22; and stage IIB = pus, loculations, and peel, n = 56.)



A

* p = 0.01 Fisher exact test, use of drainage vs. operation, stage I vs. stage IIB.



B

* p < 0.05 Fisher exact test, treatment success, drainage vs. operation.

*Fig 3. (A) Choice of first procedure by clinical stage of empyema. (*p = Fisher exact test use of drainage vs operation, stage I vs stage IIB.) (B) Outcome by stage of empyema and choice of first procedure. Procedures were drainage (black bars) or operation (striped bars). (*p < 0.05 Fisher exact test, treatment success drainage vs operation.) Stage could be evaluated in 93 of 104 empyema patients. (Stage I = free flowing fluid, no loculations, n = 15; stage IIA = pus and loculations, but no peel, n = 22; and stage IIB = pus, loculations, and peel, n = 56.)*

Table 3. Univariate Analysis

Variable[a]	Treatment Outcome		
	Success	Failure[b]	*p* Value[c]
Patients, No.	69	35	
Age, y	55.4 ± 1.6	55.2 ± 2.4	0.93
Alcohol abuse,[d] No.	28	12	0.68
Malignancy, No.	9	9	0.09
Delay,[e] d	15.1 ± 2.0	11.8 ± 2.6	0.34
APACHE II Score	8.7 ± 0.6	11.3 ± 1.1	0.02
KPS	66.8 ± 2.1	49.1 ± 3.3	0.00001[f]
CCI	2.16 ± 0.24	3.71 ± 0.58	0.004[f]
Serum albumin, g/dL	2.9 ± 0.1	2.6 ± 0.1	0.12
Loculations on chest CT, No.	32	14	0.68
Pleural fluid pH	6.97 ± 0.08	6.71 ± 0.10	0.07
Clinical stage,[g] No.			
I	11	4	0.93
IIA	13	9	0.38
IIB	40	16	0.65
First procedure choice,[h] No.			
Simple drainage	22	28	0.000003[f]
Operation	47	7	

[a] Continuous data are presented as mean ± standard error of mean. [b] Failure represents death or second drainage procedure. [c] Continuous data compared by two-tailed, unpaired *t* test, and discrete data are analyzed with the two-tailed Fisher exact test. [d] Alcohol abuse defined as consumption ≥5 drinks/d, CAGE ≥2 (Have you ever felt you should Cut down on your drinking? Have people Annoyed you by criticizing your drinking? Have you ever felt Guilty about your drinking? Have you ever had a drink first thing in the morning [Eye-opener]?), or current *Diagnostic and Statistical Manual of Mental Disorders* IV diagnosis of alcohol dependence/abuse (303.90, 305.00). [e] Days from first symptom to thoracic surgical consultation. [f] Significant by the Bonferroni method for multiple (n = 12) comparisons. [g] Stage I = free fluid, pH >7.3; stage IIA = pus ± loculations, no peel, pH <7.1; stage IIB = pus ± peel, pH <7.1; 11 patients could not be staged from information available. [h] Simple drainage includes pigtail catheter or thoracostomy tube; operation includes video-assisted thoracic surgery, thoracotomy, or Eloesser flap.

APACHE = Acute Physiology and Chronic Health Evaluation; CCI = Charlson Comorbidity Index; CT = computed tomography; KPS = Karnofsky Performance Status.

Table 4. Multivariate Analysis

Outcome Predictor Variable	Regression Coefficient	OR (95% CI)[a]	*p* Value
Death			
Karnofsky performance status	−0.06		0.002
Charlson comorbidity index	0.26		0.03
First procedure simple drainage[b]	−0.008	0.99 (0.19–5.13)	0.99
Failure of first procedure[c]	1.91	6.76 (1.45–31.4)	0.01
Failure of first procedure			
Karnofsky performance status	−0.03		0.04
Charlson comorbidity index	−0.13		0.19
First procedure simple drainage	2.4	11.1 (3.51–34.9)	0.00004
Death or failure			
Karnofsky performance status	−0.02		0.06
Charlson comorbidity index	0.04		0.69
First procedure simple drainage	2.07	7.94 (2.86–22.0)	0.00007

[a] Odds ratios (OR) reported for discrete predictor variables. [b] Simple drainage was by pigtail catheter or tube thoracostomy. [c] Second drainage procedure required, or continued sepsis associated with failure of radiographic improvement.

APACHE = Acute Physiology and Chronic Health Evaluation; CI = confidence interval.

Inferência sobre questionamento

- Questão está respondida?

Validade interna

- Erros sistemáticos
- Erros aleatórios

Validade externa

- Depende:
  - Validade interna
  - População em estudo: podemos transpô-la?

Conclusões

- Significância clínica
- Aplicabilidade