Pneumotorace: Ecografia toracica e metodiche mini- invasive

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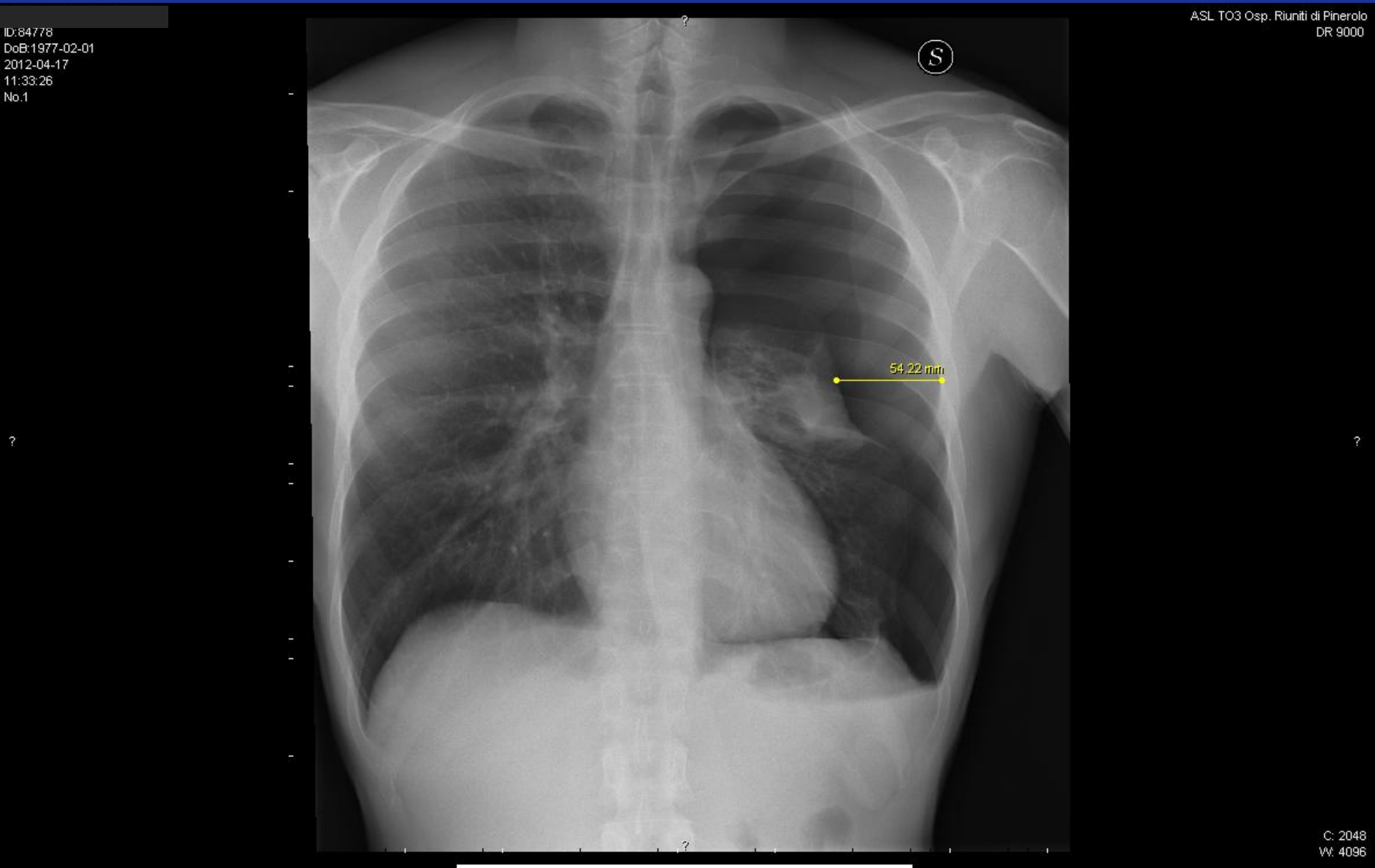
V.A. anni 35

- APP: viene in DEA il 17/4 per dolore emitorace sx e lieve dispnea
- EO: Pao 120/70 fc 92' r satO2 98% in AA Fresp 18' T 36, MV ridotto nei campi di sx
- APR: Incidente stradale nel 1999, con contusioni multiple, senza fratture o lesioni degli organi interni.
- Nel 10/2011 episodio di dolore acuto all'emitorace sn, esordito a riposo durante la notte e associato a dispnea; regressione graduale della sintomatologia in 4-5 gg (non effettuate indagini radiologiche).
- Normale sviluppo psico-fisico.
- Fumo 10-15 sigarette/die dal 1991.
- Non riferite allergie.

Primo Rx 17/4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BTS Pleural Disease Guideline 2010

MANAGEMENT OF SPONTANEOUS PNEUMOTHORAX

Spontaneous Pneumothorax
If Bilateral/Haemodynamically unstable proceed to chest drain

Age > 50 and significant smoking history Evidence of underlying lung disease on exam or CXR?

NO → Primary Pneumothorax

Size > 2cm and/or breathless

YES* → Aspirate 16–18G cannula Aspirate <2.5l

Success (< 2cm and breathing improved)

NO → Consider discharge review in OPD in 2–4 weeks

YES

* In some patients with a large pneumothorax but minimal symptoms conservative management may be appropriate

Measure the interpleural distance at the level of the hilum

The BTS Pleural Disease Guideline is endorsed by: Royal College of Physicians, London; Royal College of Surgeons of England; Royal College of Anaesthetists; Royal College of Pathologists; College of Emergency Medicine; Society for Acute Medicine; Association for Clinical Biochemistry; British Society of Clinical Cytology.

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Needle Aspiration for Pnx

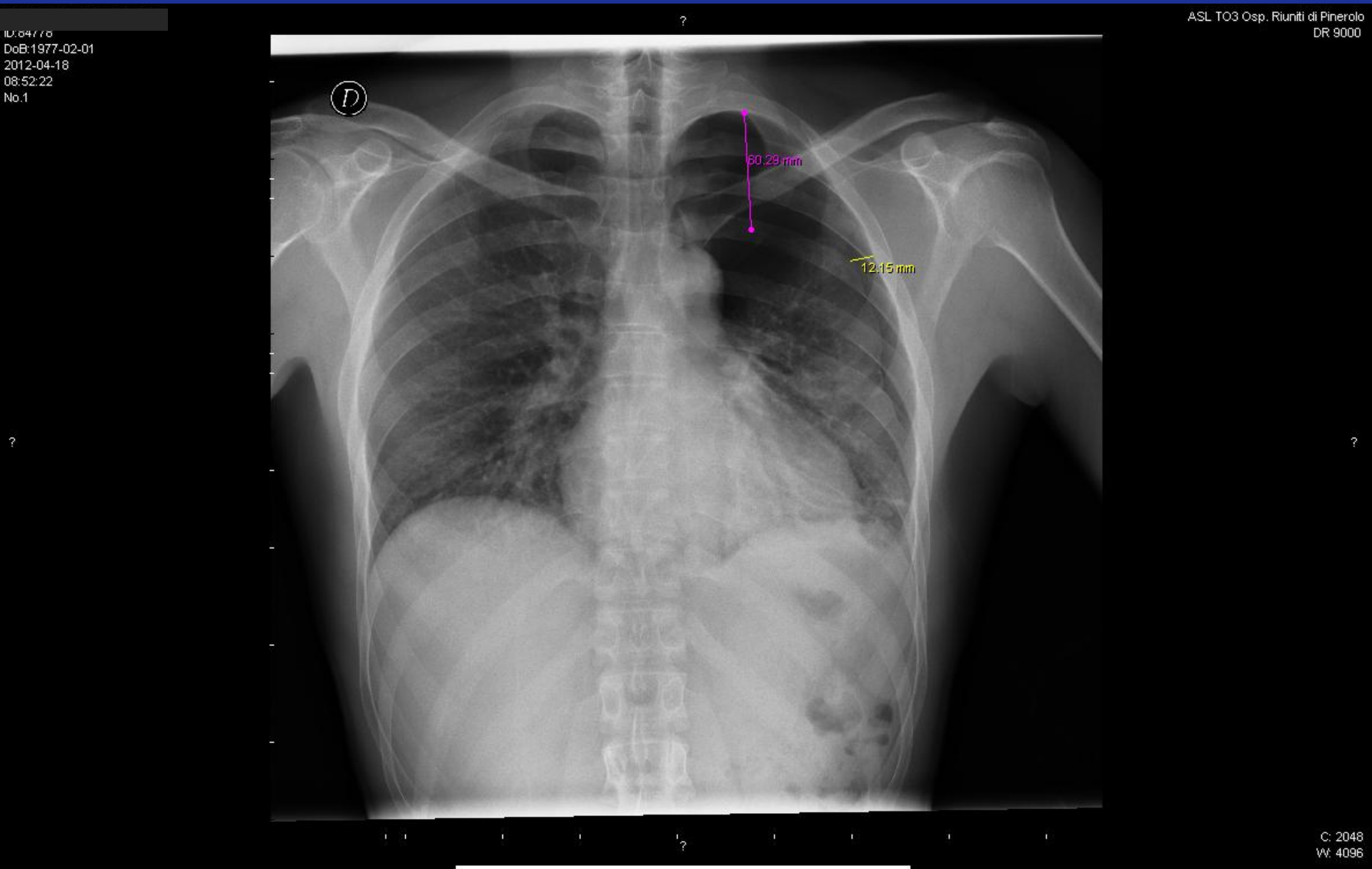
Paper	Type PnX	Pts	All %	PSP %	Predictors of failure	Vol Aspir
Archer, '85	PSP/SSP	30	63	83	>50yr; >50% collapse	4 l
Markos, '90	PSP/iatrogen	40	70		Aspirate > 4 l Age	4 l
Bevalacqua '82	PSP/SSP	50	56	70		Until no air
Seaton '91	PSP/SSP	22	45	60		4 l
Ng, '94	PSP/iatrogen	34	73		Age > 50; COPD; fibrosis, size > 50%; air > 3 l	2,5 l
Solusby '98	PSP	43	58		Age > 50, Air > 2,5 l , COPD	2,5 l
Talbot '86	PSP/iatrogenic/traumatic	76	75		Size > 33%	2,5 l
Deliles	PSP/iatrogenic/traumatic	131	69		Size not pedictor	
Carmuset 2006	PSP	35	69		Size not pedictor	Until no air
Chen 2008	PSP	161	67			Until no air

DRENAGGIO TORACICO

Needle Aspiration: 16 G, 2° spazio intercostale, 2500 cc

Needle Aspiration: 16 G, 2° spazio intercostale, 2500 cc

Secondo Rx 17/4 dopo NA



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NO → Primary Pneumothorax

YES → Secondary Pneumothorax

Primary Pneumothorax → Size > 2cm and/or breathless

YES* → Aspirate 16–18G cannula Aspirate <2.5l

Success (< 2cm and breathing improved)

YES → Consider discharge review in OPD in 2–4 weeks

NO → Chest drain Size 8–14Fr Admit

Secondary Pneumothorax → > 2 cm or breathless

YES → Chest drain Size 8–14Fr Admit

NO → Size 1–2 cm

YES → Aspirate 16–18G cannula Aspirate <2.5l

Success Size now < 1cm

NO → Chest drain Size 8–14Fr Admit

YES → Admit High flow oxygen (unless suspected oxygen sensitive) Observe for 24 hours

NO → Admit High flow oxygen (unless suspected oxygen sensitive) Observe for 24 hours

* In some patients with a large pneumothorax but minimal symptoms conservative management may be appropriate

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Frequency of post-insertion drain complications

	%	Range
Organ Injury	0,2	0-2
Malposition	0,6	0-9
Empyema	0,2	0-2
Drain Block	8,1	2-18

small drains (=<14 F)

large drains (>20 F)

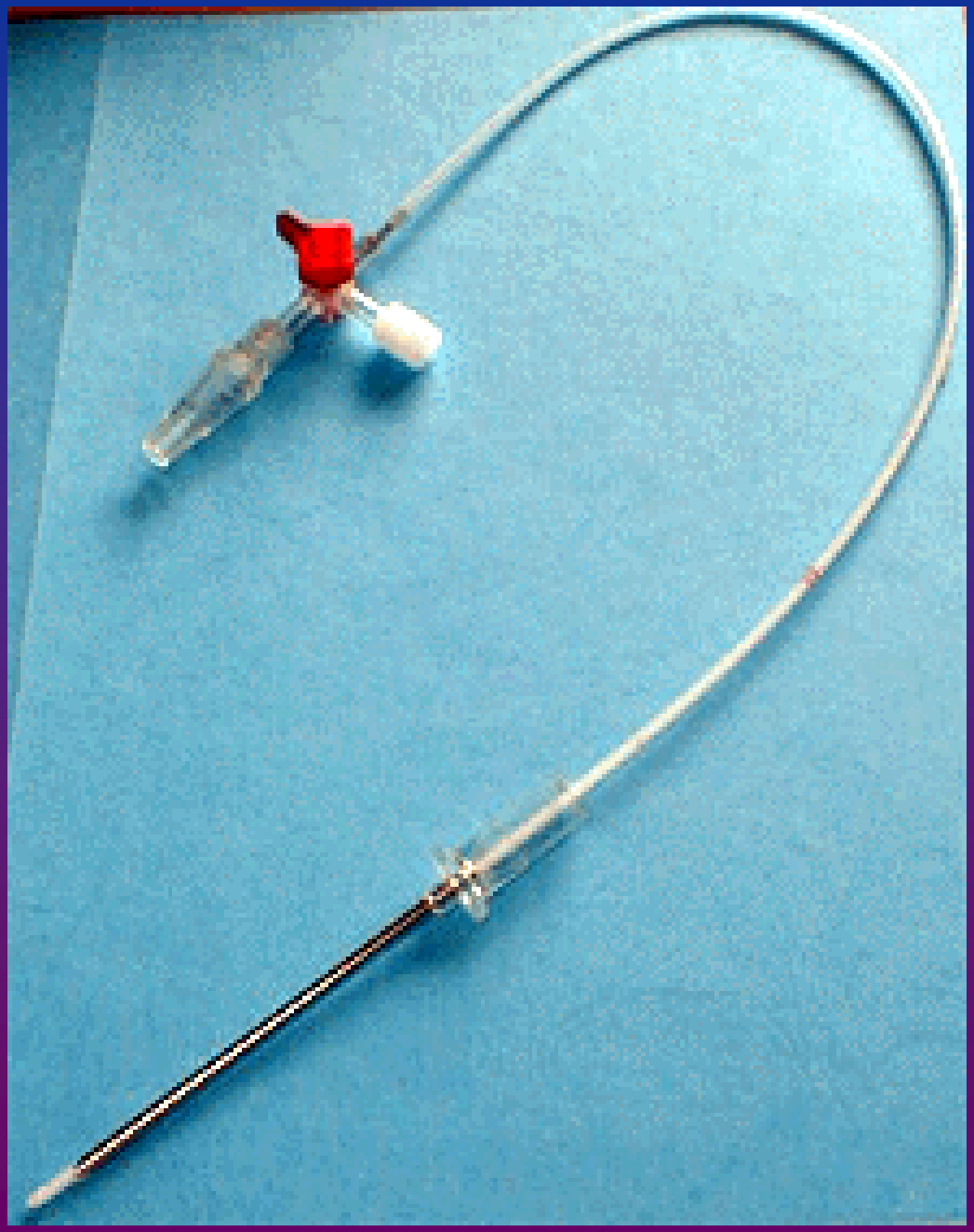
	%	Range
Organ Injury	1,4	0-8
Malposition	6,5	1,1-31
Empyema	1,4	0-2
Drain Block	5,2	5,2

Aghi e cateteri

Gauge	mm	portata ml/min
14	2.1	270
16	1.7	180
18	1.3	80
20	0,9	54
22	0,7	31
24	0,6	13

French/Ch	mm
24	8
22	7,3
20	6,7
18	6
16	5,3
14	4,7
12	4
10	3,3
9	3
8	2,7

PleuroCath



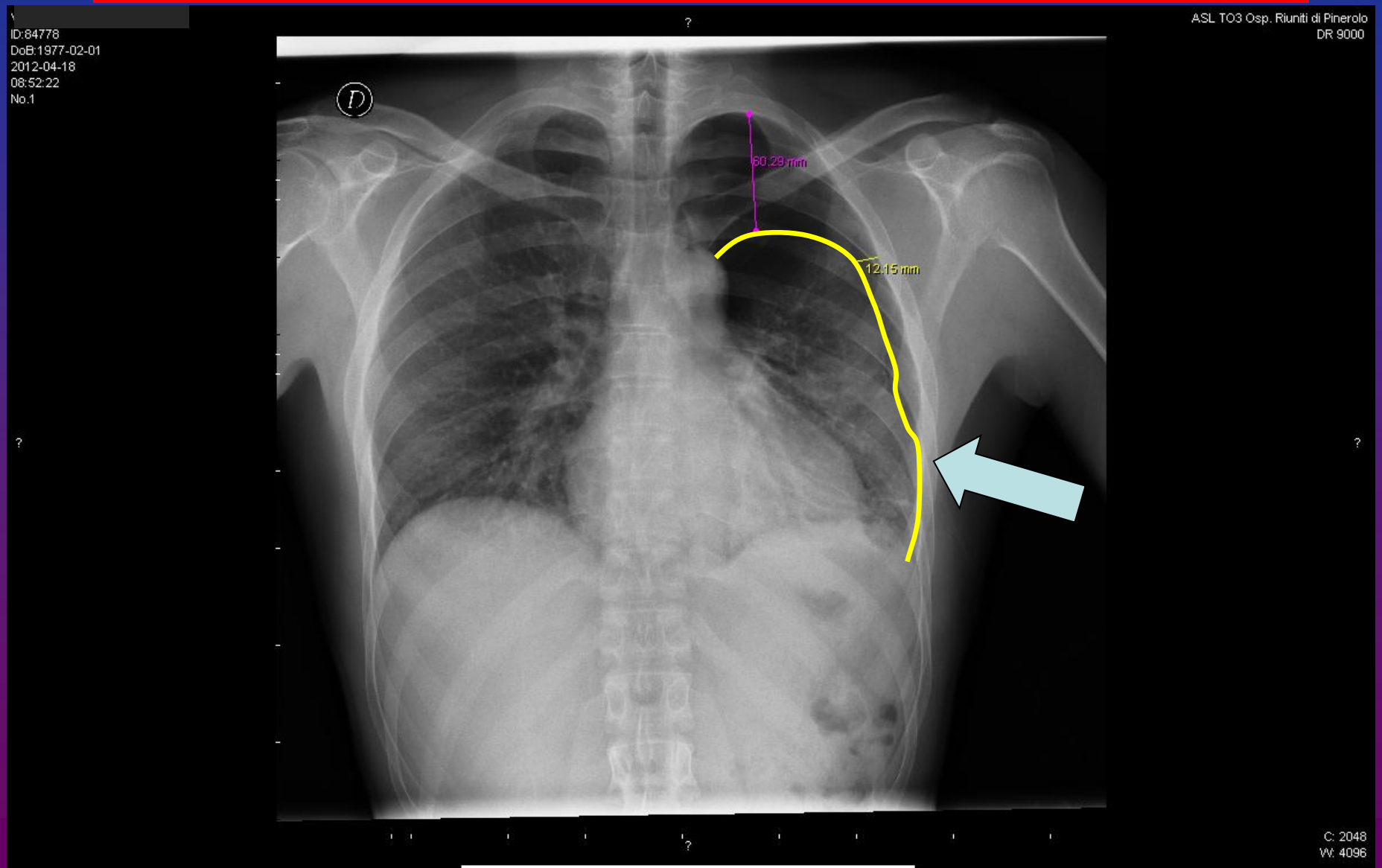
Argyle

Si inserisce come un'agocannula. All'interno del catetere è presente un mandrino con un indicatore che cambia colore quando si è raggiunto il cavo pleurico (è rosso attraversando la parete toracica, verde in cavo pleurico). La punta del mandrino protetta da un pistoncino a molla smusso che emerge quando il sistema entra nel cavo pleurico

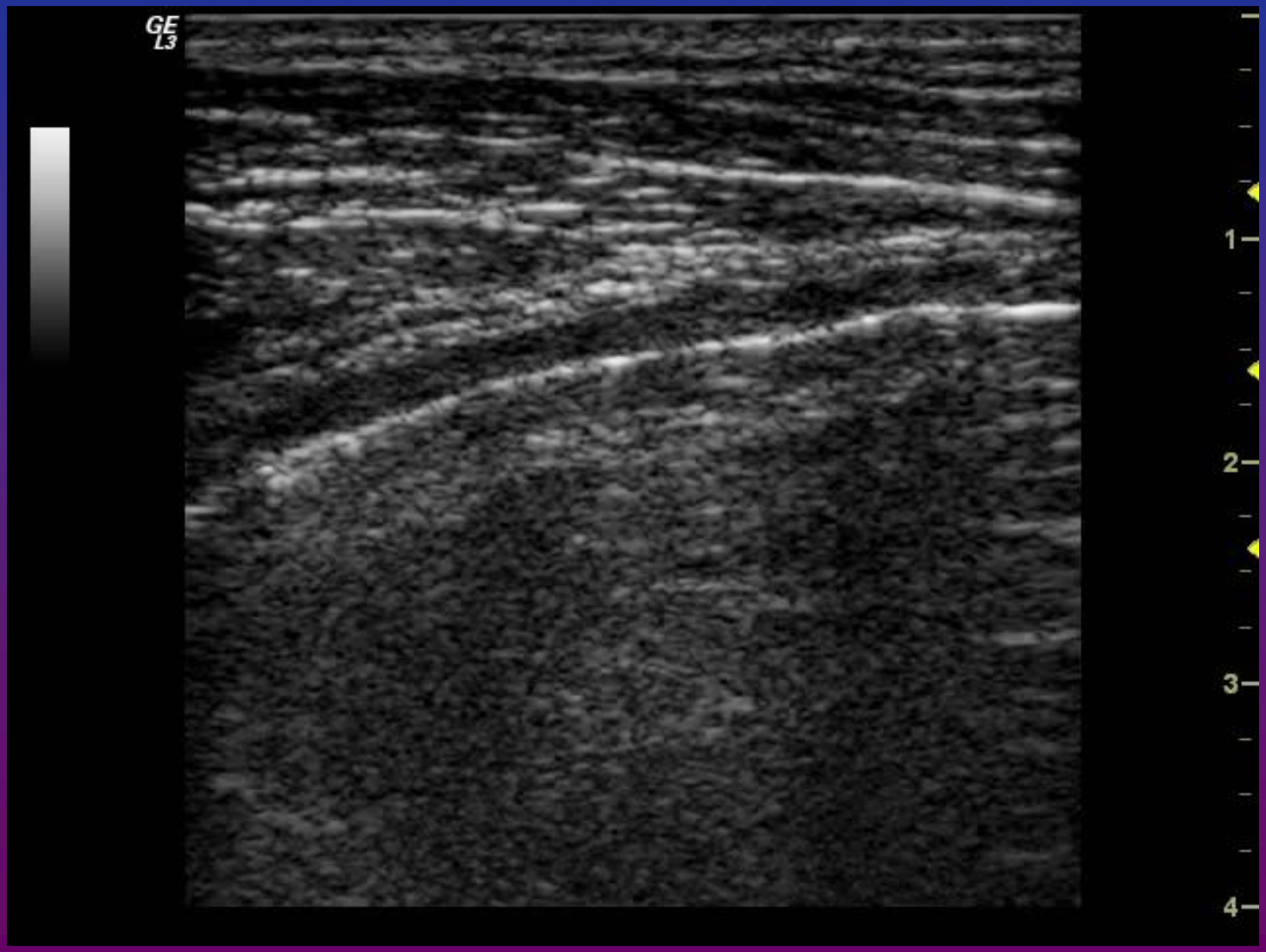
Pigtail su Seldinger

Triangle of safety

Triangle of unsafety



V.A. , M, anni 35: dispnea lieve e dolore toracico



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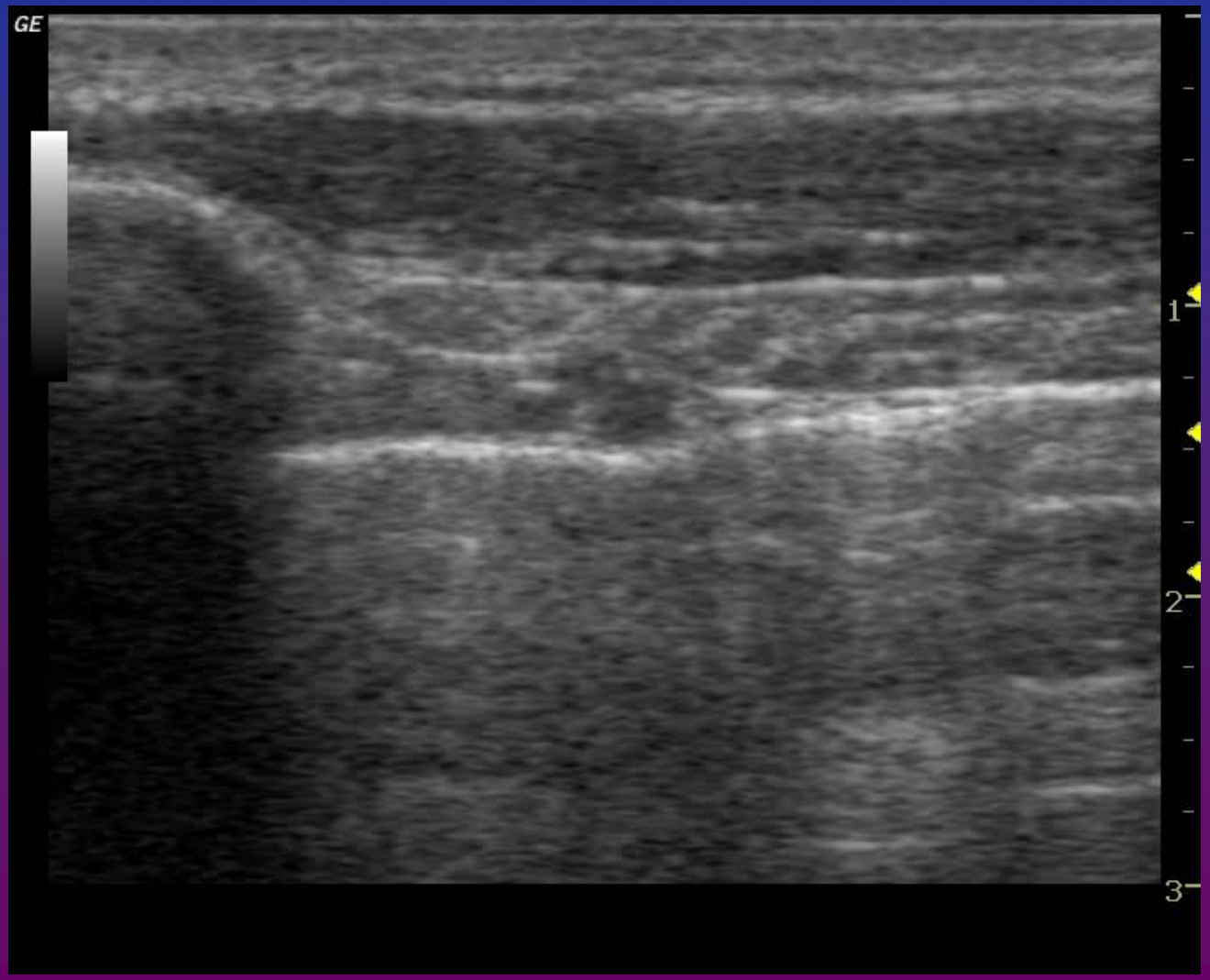

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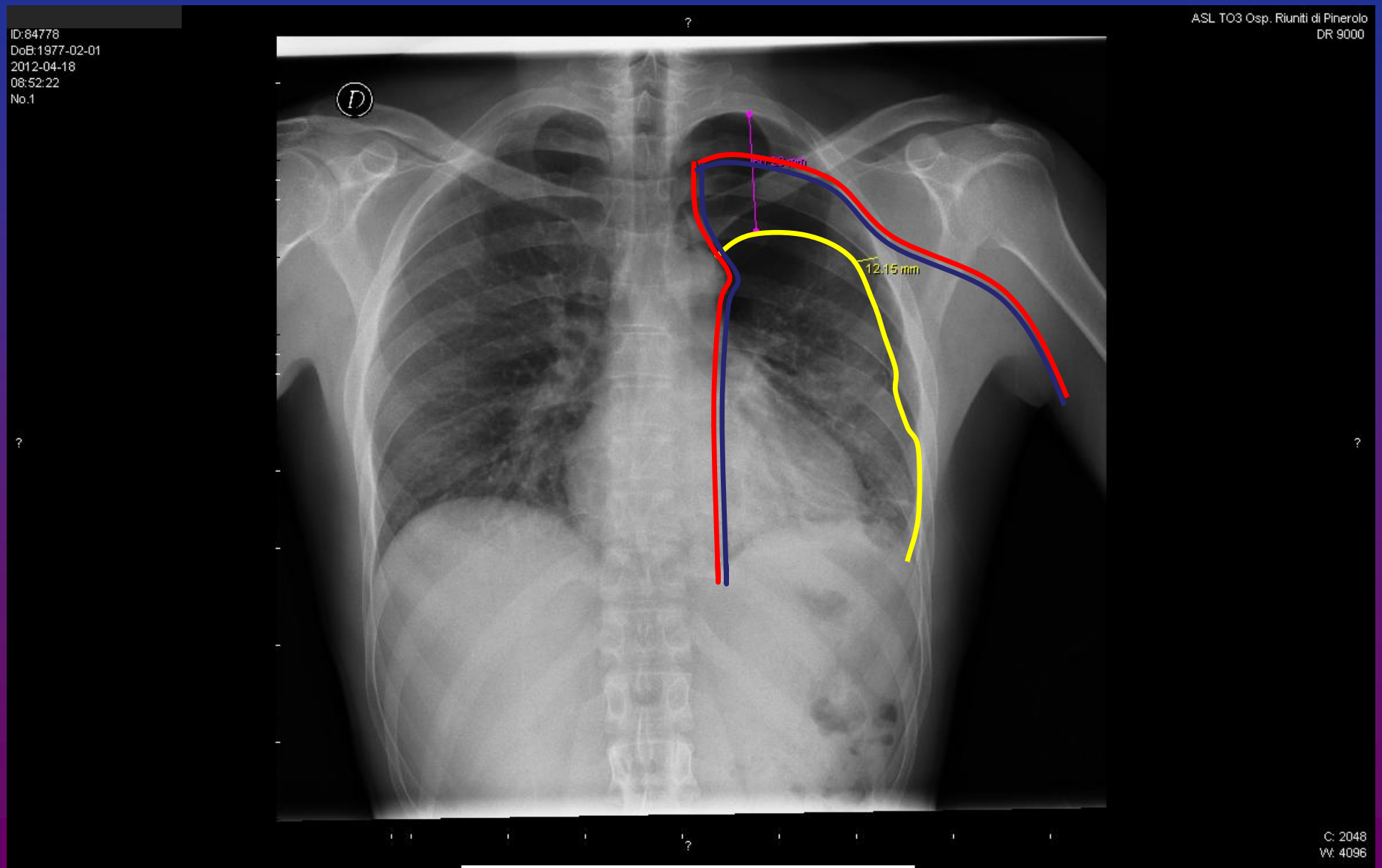
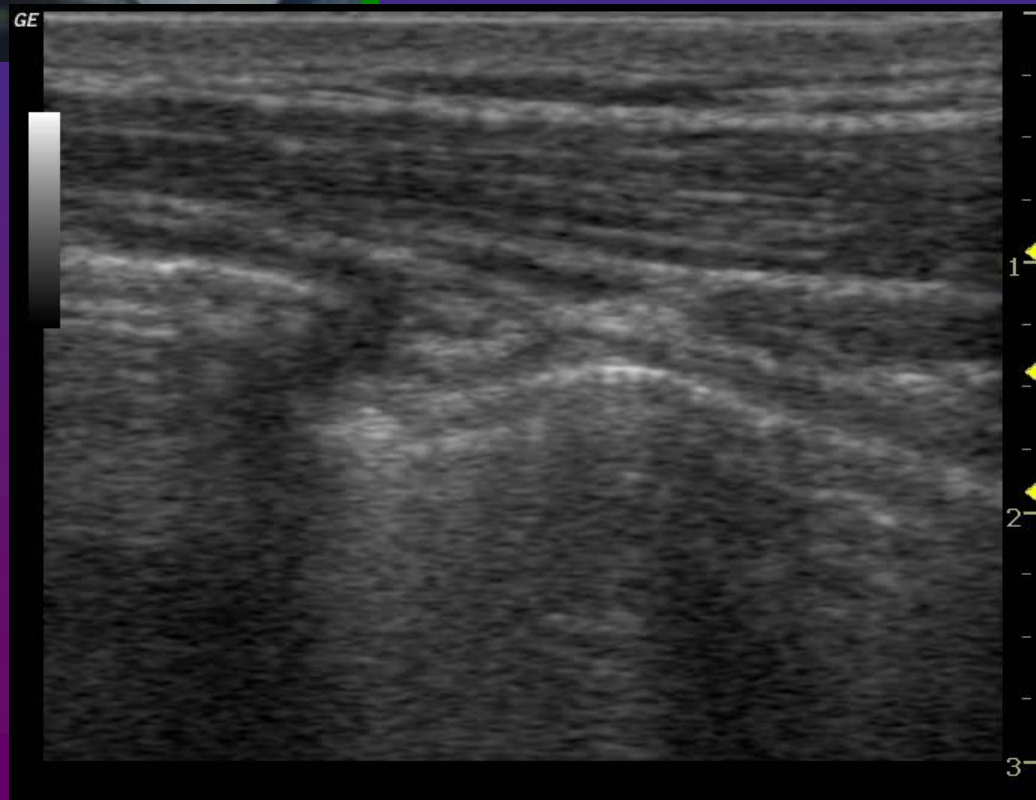
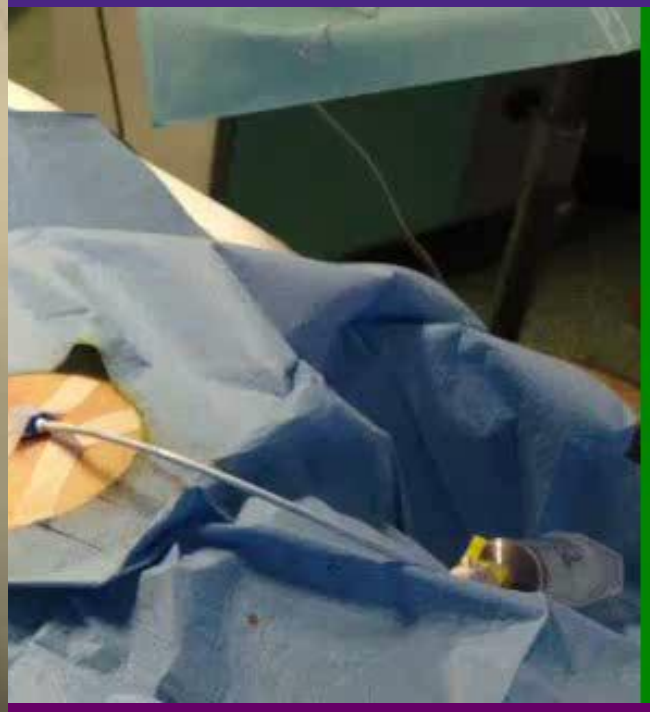


V.A. :dispnea lieve e dolore toracico



e toracico



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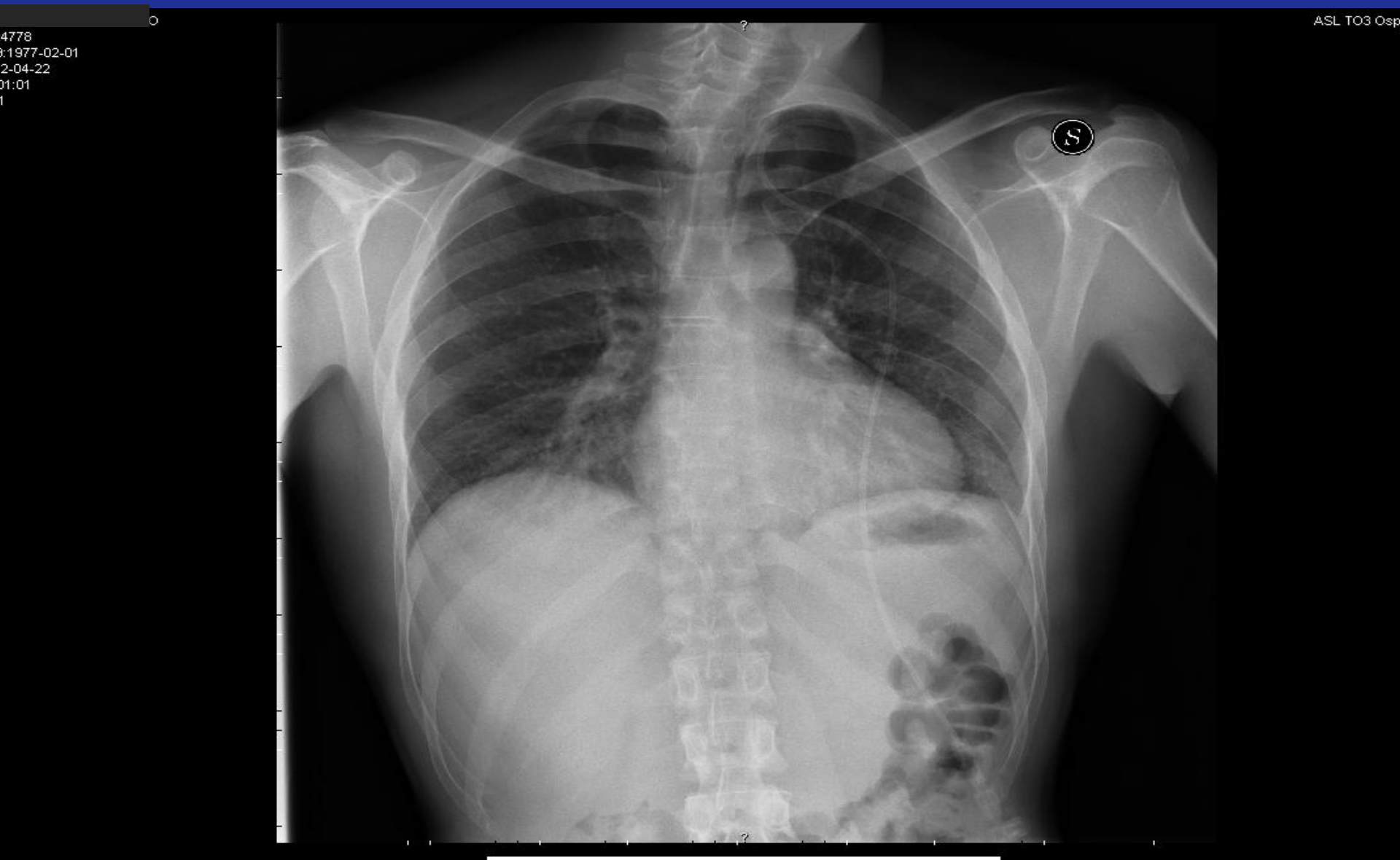
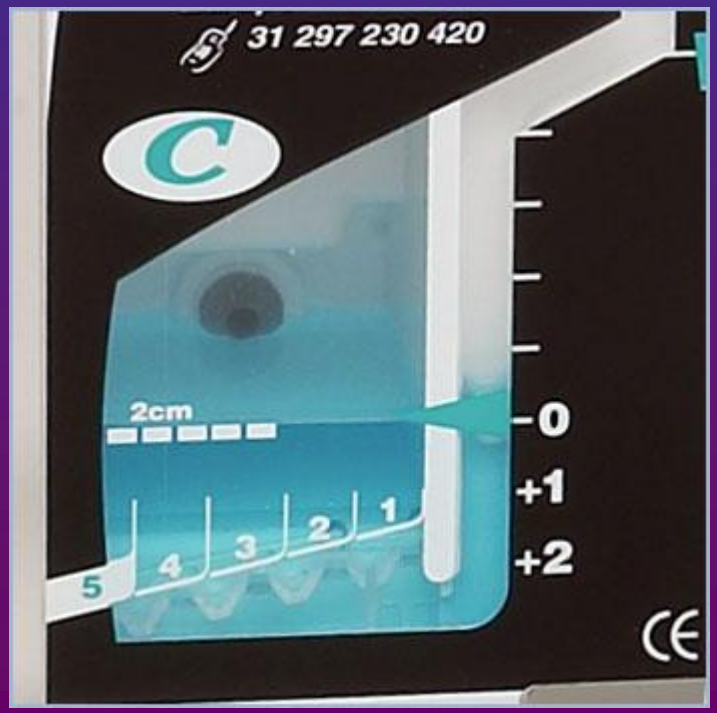
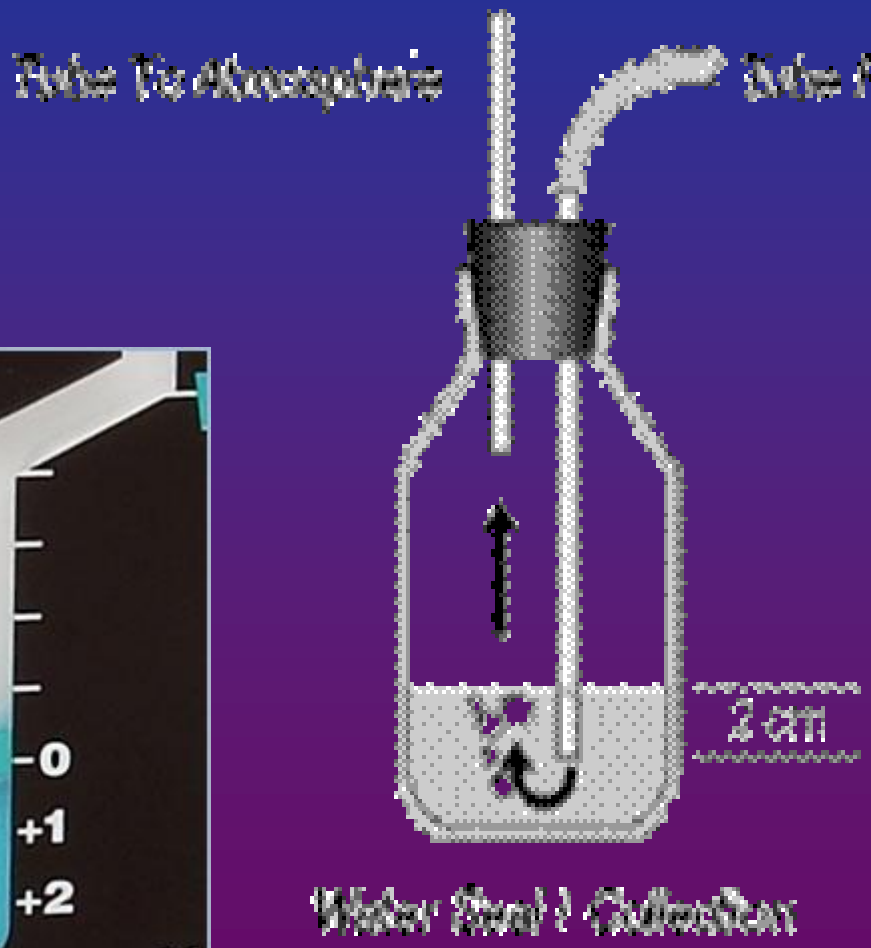


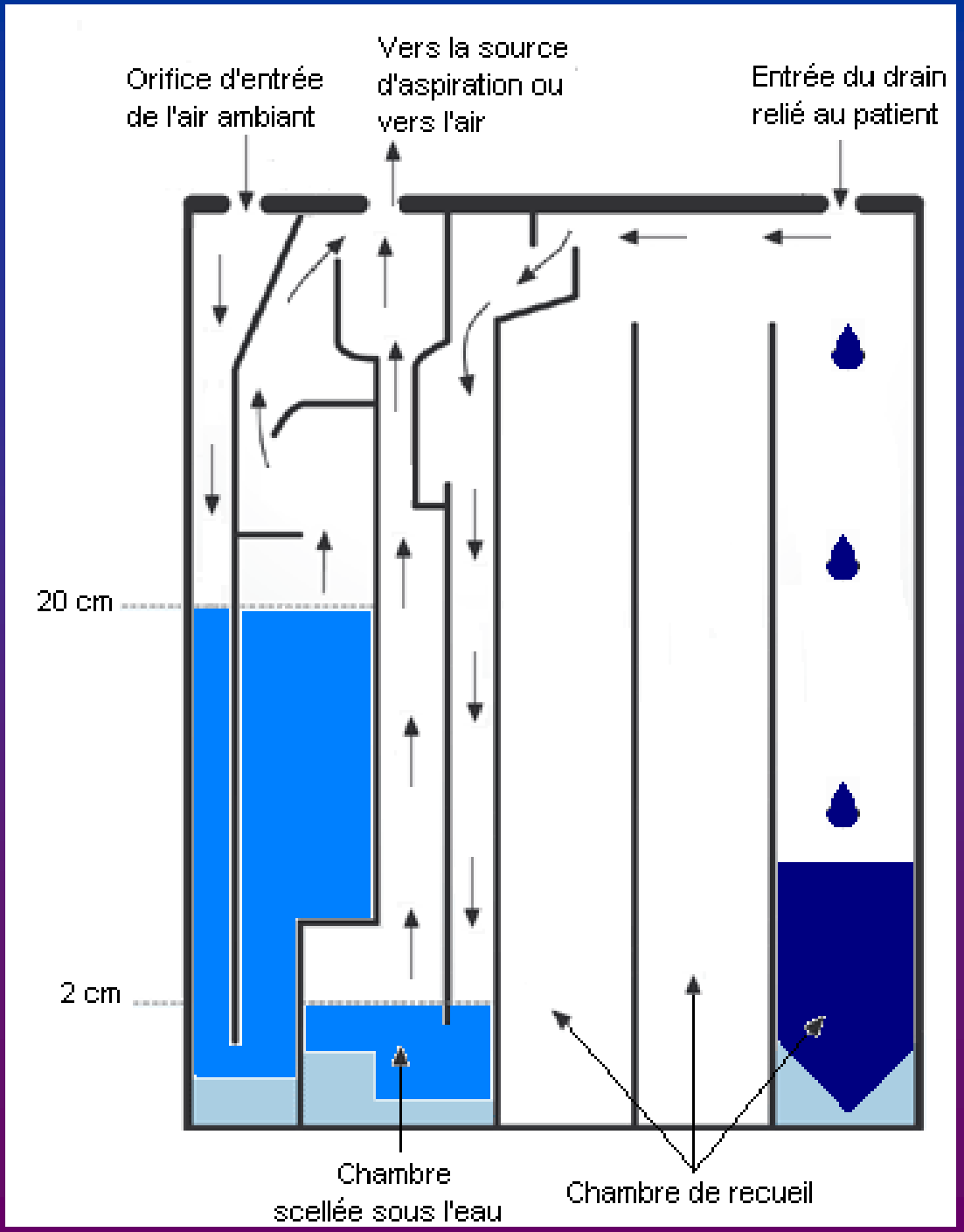
Non ci sono evidenze per raccomandare o sconsigliare l'uso di **aspirazione** (10-20cmH20) nel Pnx. Nella pratica clinica pertanto si riserva ai casi non risolti dopo drenaggio "a caduta" dopo 48 ore

Attenzione: non applicare subito l'aspirazione previene anche il RPO (fino al 14% in Pnx estesi del giovane)

Valvola ad acqua






Orifice d'entrée
de l'air ambiant
Vers la source
d'aspiration ou
vers l'air
Entrée du drain
relié au patient
20 cm
2 cm
Chambre
scellée sous l'eau
Chambre de recueil

Heimlich valve

Small-bore catheter versus chest tube drainage for pneumothorax☆

Damien Contou MD[a,*], Keyvan Razazi MD[a], Sandrine Katsahian MD,

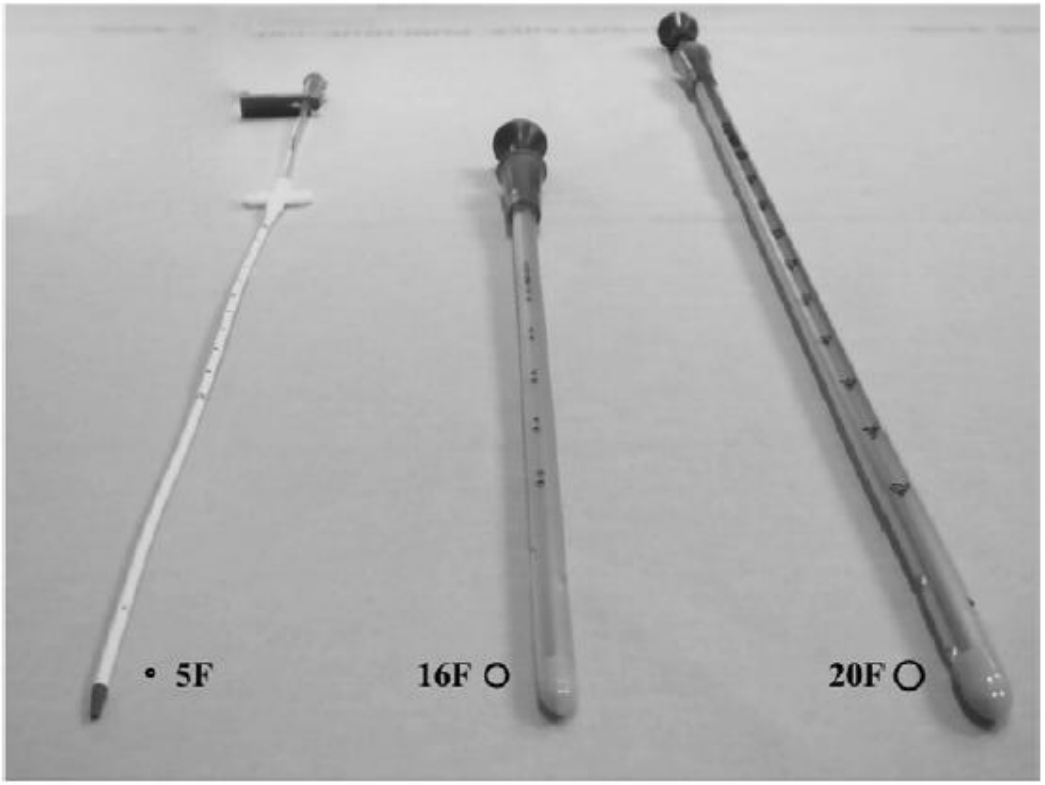


Fig. 1 Illustration of a 5F catheter (14 gauge) single-lumen CVC (left) and conventional CTs of 16F catheter (middle) and 20F catheter (right) diameter.

American Journal of Emergency Medicine (2011)

Small-bore catheter versus chest tube drainage for pneumothorax☆

Damien Contou MD[a,*], Keyvan Razazi MD[a], Sandrine Katsahian MD,

Table 1 Comparison of patients' characteristics and outcome according to the cause of pneumothorax

	PSP (n = 117)	SSP-COPD (n = 28)	Traumatic (n = 19)	Iatrogenic (n = 48)
Characteristics				
Age, y	27 ± 7	58 ± 10 *	36 ± 15 *	62 ± 19 *
Male sex, n (%)	100 (85)	25 (89)	17 (89)	30 (62) *
Smoking status, n (%)	80 (68)	28 (100) *	8 (42) *	23 (48) *
Dyspnea, n (%)	47 (40)	22 (79) *	5 (26)	24 (50)
Chest pain, n (%)	114 (97)	19 (68) *	18 (95)	9 (19) *
Spo_2 (%)	96 ± 3	90 ± 6 *	96 ± 3	93 ± 6 *
Days between onset and drainage	2.0 ± 2.5	3.1 ± 2.4 *	1.6 ± 1.5	2.0 ± 1.9
Outcome				
Duration of drainage, d	3.8 ± 2.0	5.3 ± 3.7 *	3.6 ± 1.9	3.4 ± 1.8
Length of stay, d	4.7 ± 2.8	7.4 ± 5.1 *	4.5 ± 2.2	4.3 ± 2.0
Primary drainage failure, n (%)	27 (23)	10 (36)	3 (16)	1 (2) *
Surgery, n (%)	25 (21)	9 (32)	2 (10)	0 (0) *

* $P < .05$ as compared with PSP.

Small-bore catheter versus chest tube drainage for pneumothorax☆

Damien Contou MD[a,*], Keyvan Razazi MD[a], Sandrine Katsahian MD,

Table 2 Comparison of patients' characteristics and outcome according to the type of drainage.

	CVC (n = 112)	CT (n = 100)	*P*
Characteristics			
Age, y	38 ± 19	42 ± 21	.12
Smoking status, n (%)	72 (64%)	67 (67%)	.77
PSP, n (%)	71 (63%)	46 (46%)	.01
COPD, n (%)	9 (8%)	19 (19%)	.02
Traumatic, n (%)	6 (5%)	13 (13%)	.06
Iatrogenic, n (%)	26 (23%)	22 (22%)	.87
Days before drainage	2.0 ± 2.4	2.3 ± 2.1	.28
Period, 2008-2010, n (%)	83 (74%)	6 (6%)	<.001
Outcome			
Duration of drainage, d	3.3 ± 1.9	4.6 ± 2.6	<.01
Length of stay, d	4.5 ± 3.2	5.5 ± 3.0	.02
Primary drainage failure, n (%)	20 (18%)	21 (21%)	.60
Surgery, n (%)	16 (14%)	20 (20%)	.28

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significant smoking history
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lung disease on exam
or CXR?

YES → Secondary Pneumothorax

> 2 cm or breathless

YES → Chest drain
Size 8–14Fr
Admit

NO → Size 1–2 cm

YES → Aspirate
16–18G cannula
Aspirate <2.5l

Success
Size
now < 1cm

NO → Chest drain
Size 8–14Fr
Admit

YES → Admit
High flow oxygen (unless suspected oxygen sensitive)
Observe for 24 hours

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d; Royal College of Physicians of Edinburgh; Royal College of Surgeons of Edinburgh; Royal College of Physicians and Surgeons of Glasgow; Royal College of Radiologists;
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Ambulatory Management of Large Spontaneous Pneumothorax With Pigtail Catheters

Voisin et al Annals *of* Emergency Medicine 227 Volume 64, NO. 3 : September 2014

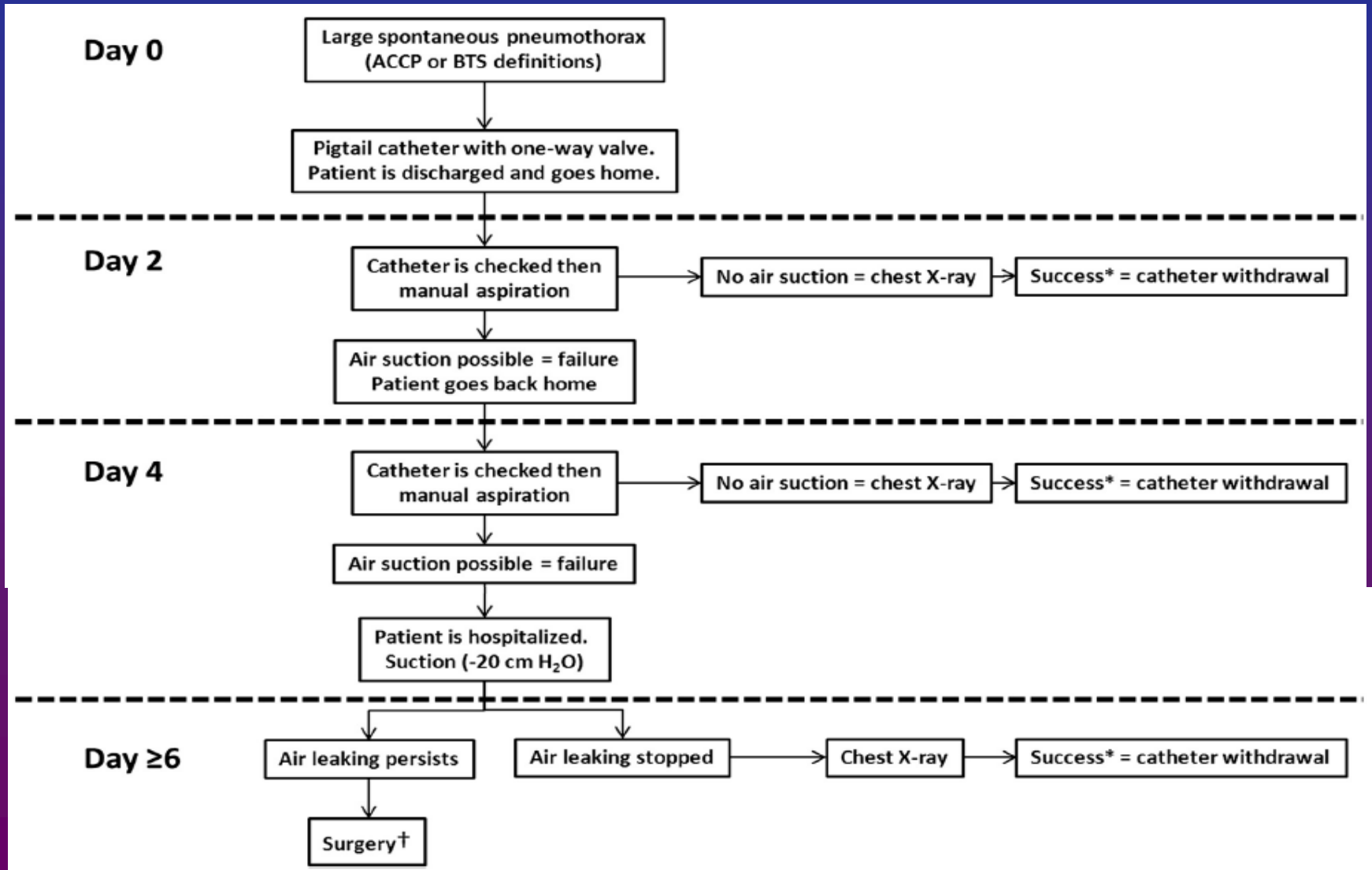
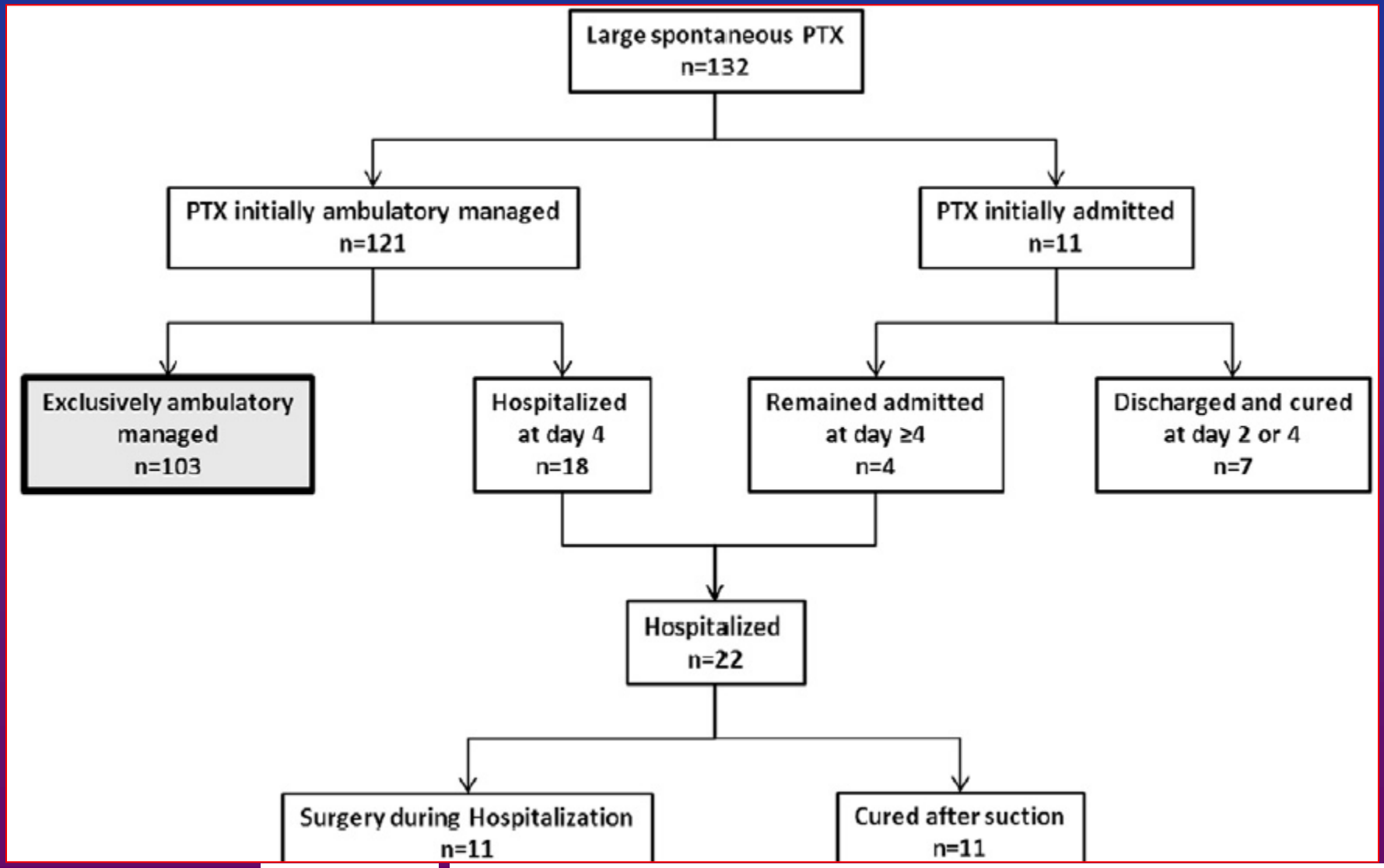


Figure 3. Flow chart of the evolution of patients with a large spontaneous pneumothorax managed following our algorithm. A total of 103 patients (78%) were exclusively managed as outpatients.



Drenaggio toracico

- Pneumotorace (tranne barotrauma)
- Empiema o versamento parapneumonico
- Versamento “maligno”
- Chilotorace

NA / drenaggio =< 14 Fr

- Pneumotorace in PPV
- Emotorace

drenaggio > = 20 Fr

PNX iatrogeno

- CVC (specie succlavia)
- Needle aspiration
- Toracentesi (“ex vacuo” + air leak)
- Biopsia (transtoracica o transbronhiale)
- Ventilazione meccanica

Osservazione +/- NA → risoluzione 89%

Drenaggio grosso calibro

Consulenza chirurgo Toracico

- Recidiva omolaterale
- Recidiva di PSP controlaterale
- Pnx bilaterale sincrono
- Perdita aerea o non riespansione a (3) 5-7 gg
- Emotorace spontaneo (per es “catameniale”)
- Fibrosi cistica
- Professioni a rischio (piloti, autisti)
- Gravidanza

Obiettivi chirurgici (minitoracotomia o VATS):
1) Resezione Bolle o Blebs visibili
2) Pleurodesi mediante “abrasione pleurica” o talcaggio

Procedure Pleuriche

1. Management of spontaneous pneumothorax: British Thoracic Society pleural disease guideline 2010, *Thorax 2010;65(Suppl 2)*
2. Pleural procedures and thoracic ultrasound: British Thoracic Society pleural disease guideline 2010, *Thorax 2010;65(Suppl 2)*
3. Risk reduction in pleural procedures: sonography, simulationand supervision, John M. Wrightson, *Current Opinion in Pulmonary Medicine 2010,16:340–350*
4. Management of Emergency Department Patients With PrimarySpontaneous Pneumothorax: Needle Aspiration or TubeThoracostomy?, *AnnEmerg Med. 2008;51:91-100*.
5. Pleural controversy: Optimal chest tube size for drain**,** W. LIGHT, *Respirology* (2011) **16**, 244–248

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