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EUROPEAN LUNG CANCER CONFERENCE

Thymic malignancies: an update
Surgical management of thymic malignancies

Enrico Ruffini
Thoracic Surgery, University of Torino, Italy

Geneva, Switzerland, 13-16 April 2016

What's new in thymic neoplasms

Alberto Antonicelli and Frank Detterbeck

KEY POINTS

- Progress in a rare disease requires collaboration.
- Development of a common language, a global database, tissue bank and an engaged community has established an infrastructure to facilitate progress.
- The first formal stage classification system for thymic malignancies has been developed.
- Innovative approaches to research are needed in a rare disease.

Curr Opin Pulm Med, 2015

Thymic tumors

Thymomas →
- Organotypic tumours (Unique morphology; produce immature T cells)
- 5 Subtypes

Thymic Carcinomas →
- Nonorganotypic tumours (similar morphology in many organs; do not promote maturation of intratumorous immature T cells)
- 10 Subtypes

Neuroendocrine Thymic Tumours (NETT) →
- Nonorganotypic tumours
- 4 subtypes

WHO, 2004

Pathology

Table 1
Comparison of three thymoma classifications

Traditional [1]	WHO 2004 [6]	Suster and Moran [20]
Spindle cell	A	Thymoma
—	AB	Thymoma
Lymphocyte-rich	B1	Thymoma
Mixed lymphoepithelial	B2	Thymoma
Epithelial-rich	B3	Atypical thymoma
—	Thymic carcinoma	Thymic carcinoma

Thymic carcinoma

- **Squamous cell**
- **Basaloid**
- **Mucoepidermoid**
- **Lymphoepithelioma-like**
- **Sarcomatoid**
- **Clear cell**
- **Papillary and nonpapillary adenoca**
- **Carcinoma with t(15:19)**
- **Undifferentiated carcinoma**
- **Neuroendocrine tumors (NETT) (carcinoid, atypical carcinoid, large and small cell NETT)**

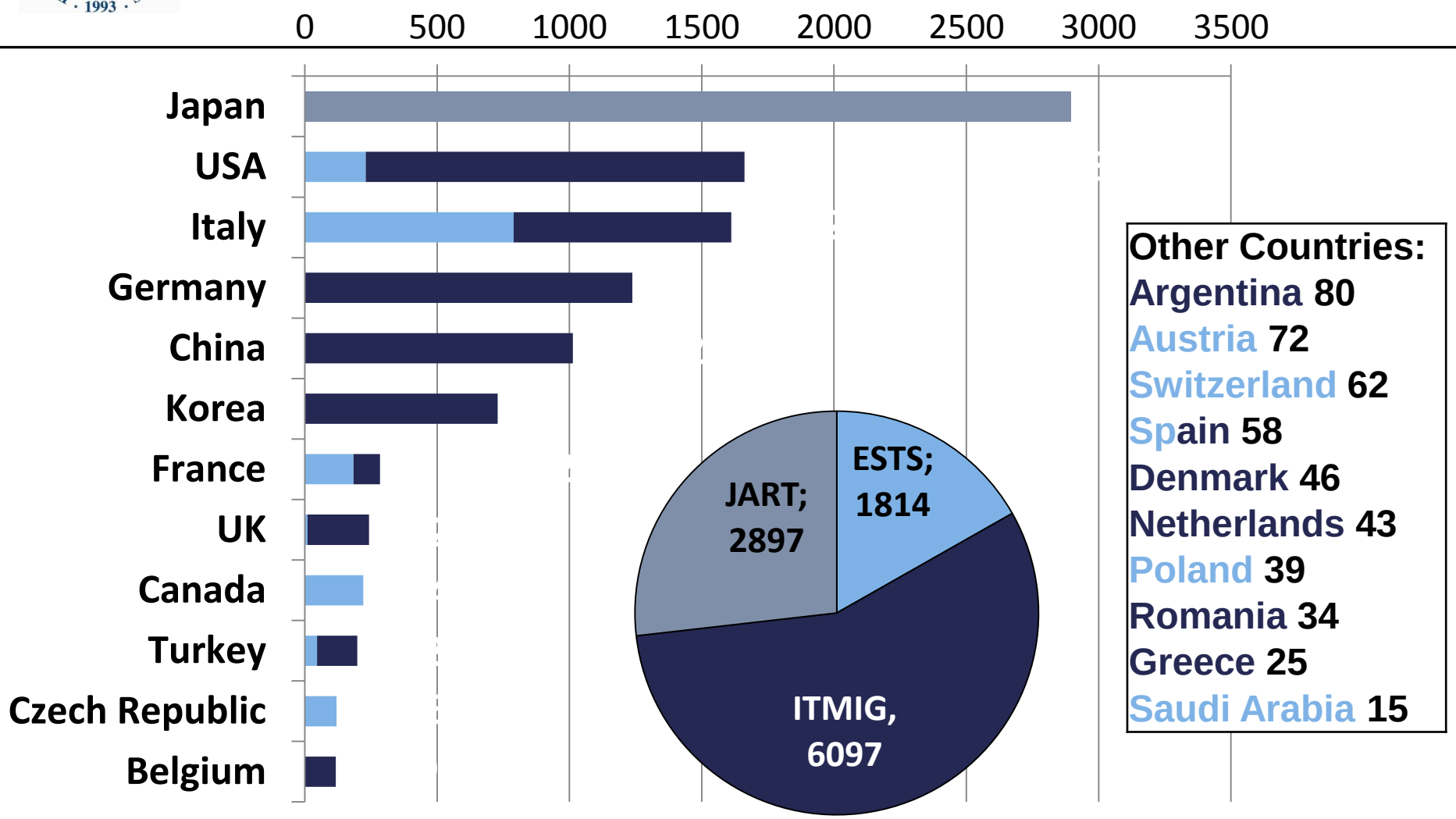
Suster Moran, 2008

Presentation overview

- The TNM-based staging system for thymic tumors
- Update in surgery for early and locally advanced thymic tumors
- Update in advanced disease and thymic tumors guidelines
- Update on the ESTS thymic group
- Conclusions

The TNM-based staging system of thymic tumors

IASLC Database



T Invasion – Levels of Invasion

OS, any R	Sample Size
Level 1: Stage I or II, or med pl only - Stage I or II (no med pl) - Stage II or III with med pl only	5138 - 4815 - 323
Level 2: Pericardium	195
Level 3: Lung, Brach Vein, SVC, Chest Wall, Phrenic Nerve - Single Level 3 structure	580 - 289
- Single Level 4 structure - Single Level 4 structure + Level 2 - Single Level 4 structure + Level 3 structure(s) w/ or w/o Level 2 - Multiple Level 4 structures w/ or w/o Level 2 or 3 structure(s)	
Stage III, NOS	304

The level of invasion reflects the highest degree of invasion (one/more structure of that level) regardless of how many other structures (lower levels) are invaded.

The new proposed TNM staging system for thymic tumors (IASLC/ITMIG)

T factor

TABLE 1. T Categories and Descriptors

T	Descriptors
T1	A tumor that either is limited to the thymus with or without encapsulation, directly invades into the mediastinum only or directly invades the mediastinal pleura but does not involve any other mediastinal structure For further testing, T1 is subdivided into T1a (no mediastinal pleural involvement) and T1b (direct invasion of the mediastinal pleura) *(Level 1 structures—thymus, anterior mediastinal fat, mediastinal pleura)*
T2	A tumor with direct invasion of the pericardium (either partial or full-thickness) *(Level 2 structures—pericardium)*
T3	A tumor with direct invasion into any of the following: lung, brachiocephalic vein, SVC, phrenic nerve, chest wall, or extrapericardial pulmonary artery or veins *(Level 3 structures—lung, brachiocephalic vein, SVC, phrenic nerve, chest wall, hilar pulmonary vessels)*
T4	A tumor with invasion into any of the following: aorta (ascending, arch, or descending), arch vessels, intrapericardial pulmonary artery, myocardium, trachea, esophagus *(Level 4 structures—aorta [ascending, arch, or descending], arch vessels, intrapericardial pulmonary artery, myocardium, trachea, esophagus)*

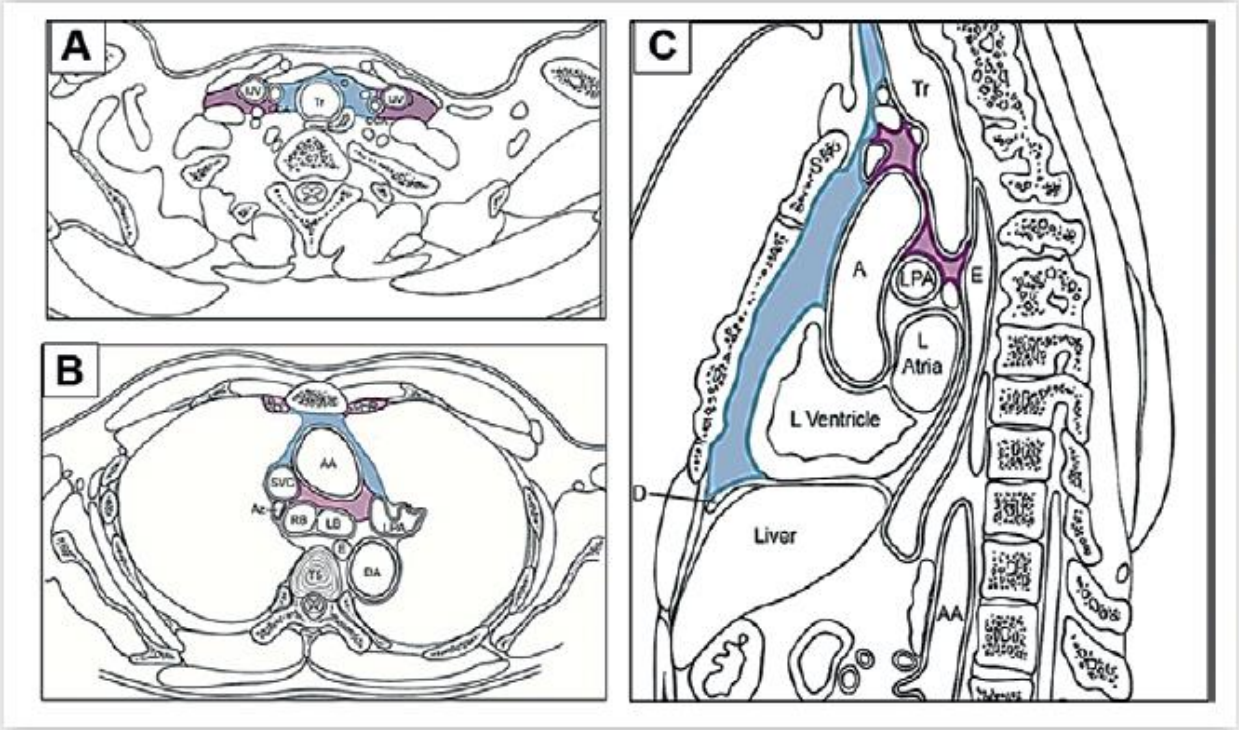
JTO, 2014

The new proposed TNM staging system for thymic tumors (IASLC/ITMIG)

Thymic nodal map

Anterior
Perithymic
Cervical up to carotid sheats

Deep
No. 4,5,6,7, 10
Cervical jugular
Supraclavicular
Internal mammary



JTO, 2014

The new proposed TNM staging system for thymic tumors (IASLC/ITMIG)

N and M factors

TABLE 2. N and M Descriptors

Category	Definition (Involvement of)[a]
N0	No nodal involvement
N1	Anterior (perithymic) nodes
N2	Deep intrathoracic or cervical nodes
M0	No metastatic pleural, pericardial, or distant sites
M1	
a	Separate pleural or pericardial nodule(s)
b	Pulmonary intraparenchymal nodule or distant organ metastasis

[a]Involvement must be pathologically proven in pathologic staging.

JTO, 2014

The new proposed TNM staging system for thymic tumors (IASLC/ITMIG)

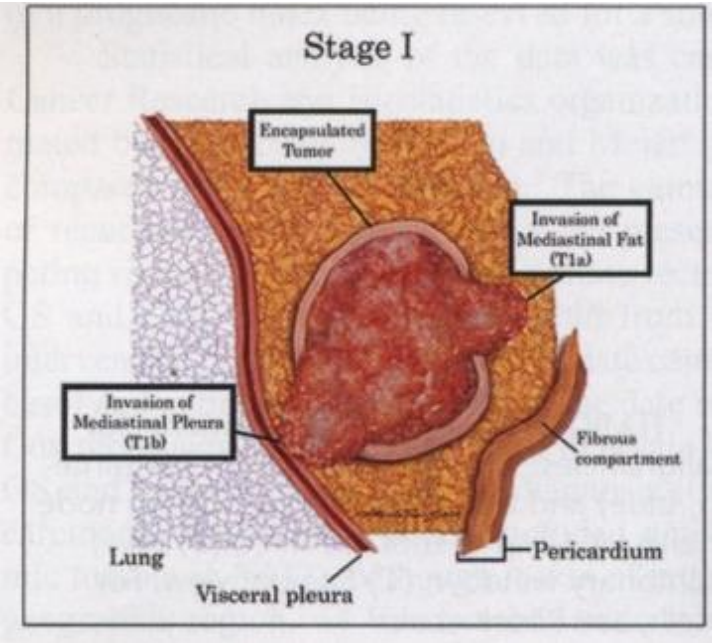
Stage grouping

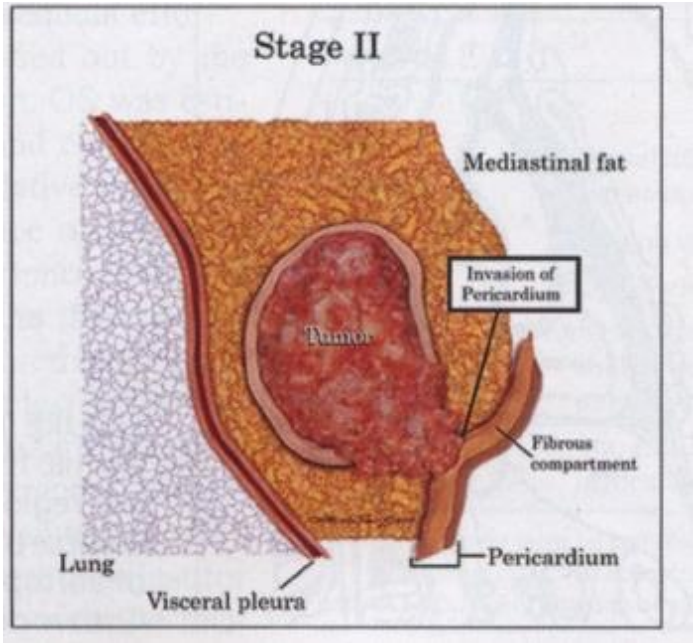
TABLE 3. Stage Grouping

Stage	T	N	M
I	**T1**	N0	M0
II	**T2**	N0	M0
IIIa	**T3**	N0	M0
IIIb	**T4**	N0	M0
IVa	T any	**N1**	M0
	T any	N0,1	**M1a**
IVb	T any	**N2**	M0,1a
	T any	N any	**M1b**

JTO, 2014

The new proposed TNM staging system for thymic tumors (IASLC/ITMIG)

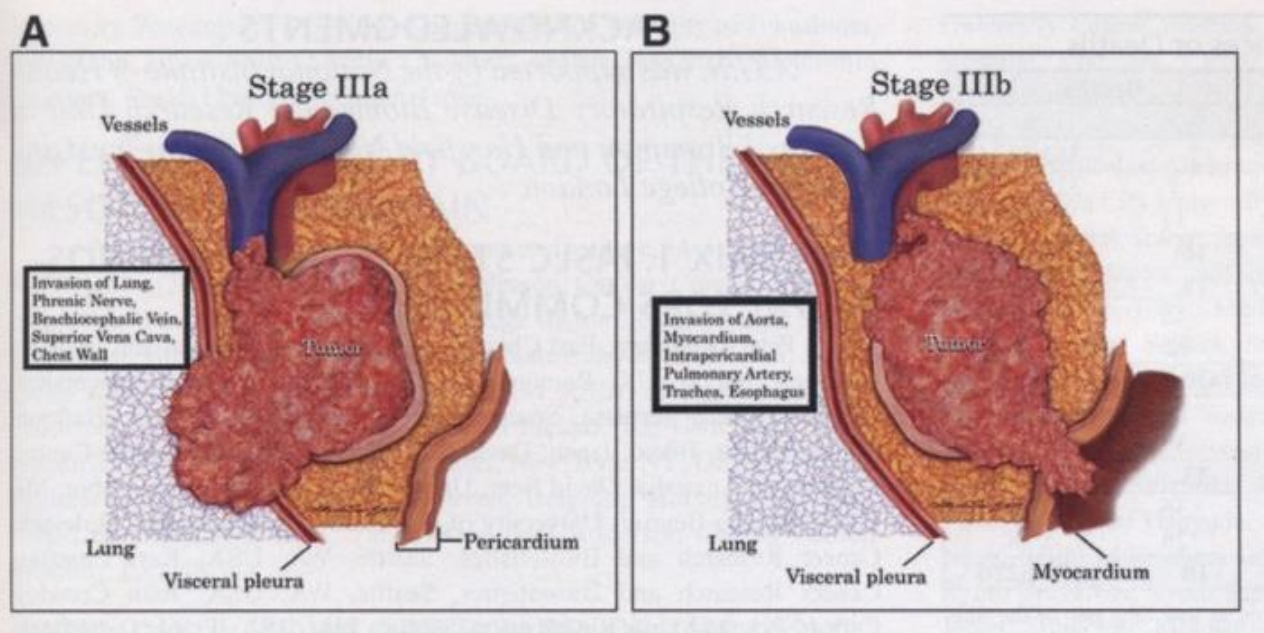




Early stages →

Stage I Encapsulated, Mediastinal pleura and fat T1N0
Stage II Pericardium T2N0

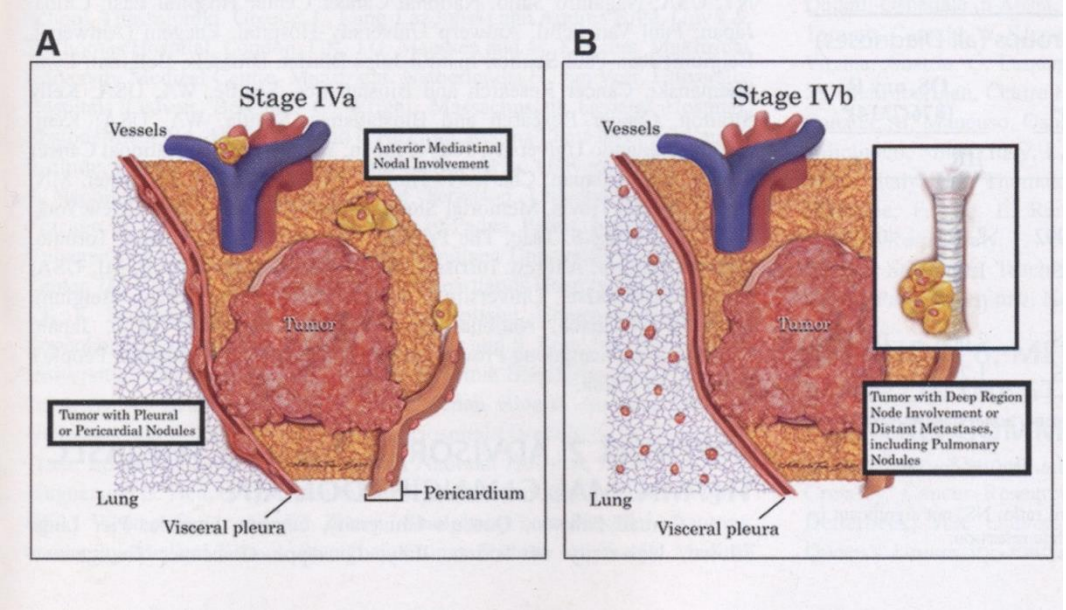
The new proposed TNM staging system for thymic tumors (IASLC/ITMIG)



Locally advanced stages

Stage IIIa Mediastinal structures, potentially resectable	T3N0
Stage IIIb Mediastinal structures, usually unresectable	T4N0

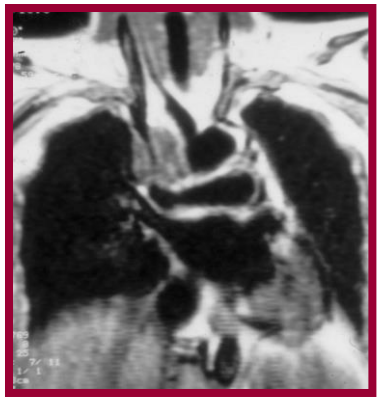
The new proposed TNM staging system for thymic tumors (IASLC/ITMIG)



Advanced stages

Stage IVa Anterior med lymphnodes, pleural/pericardial nodes	TanyN1M0, TanyN0M1a
Stage IVb Deep med lymphnodes, distant Mets, lung nodes	TanyN2M0, TanyN01M1b

Thymic tumors
Masaoka-Koga Stage III -> IASLC/ITMIG



	IASLC/ITMIG TNM
Mediastinal pleura	Stage I
Pericardium	Stage II
Lung	Stage IIIa
Chest wall	Stage IIIa
Diaphragm	Stage IIIa
Phrenic nerve(s)	Stage IIIa
Great vessels (SVC, innominate)	Stage IIIa
Great vessels (Arteries)	Stage IIIb
Heart	Stage IIIb
Other (trachea, esoph)	Stage IIIb

Complete resection rate varies among the different series depending upon the experience of the centres (30%-88%)

TNM-based staging system
Thymic tumors

The IASLC/ITMIG Thymic Epithelial Tumors Staging Project: Proposal for an Evidence-Based Stage Classification System for the Forthcoming (8th) Edition of the TNM Classification of Malignant Tumors

Frank C. Detterbeck, MD, Kelly Stratton, MS,† Dorothy Giroux, MS,† Hisao Asamura, MD,‡ John Crowley, PhD,† Conrad Falkson, MBChB,§, Pier Luigi Filosso, MD,‖, Aletta A. Frazier, MD,‖‖‖ Giuseppe Giaccone, MD,¶, James Huang, MD,#, Jhingook Kim, MD,**, Kazuya Kondo, MD,††, Marco Lucchi, MD,‡‡, Mirella Marino, MD,§§, Edith M. Marom, MD,‖‖, Andrew G. Nicholson, MD,¶¶, Meinoshin Okumura, MD,##, Enrico Ruffini, MD,‖, Paul Van Schil, MD,*** on behalf of the Staging and Prognostic Factors Committee,††† Members of the Advisory Boards,‡‡‡ and Participating Institutions of the Thymic Domain§§§*

JTO, 2014

TNM-based staging system
Thymic tumors

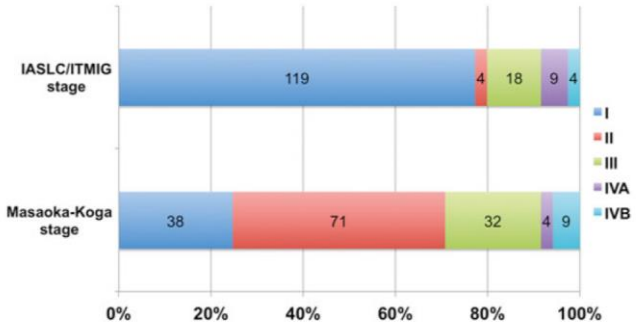
- Draft presented (Denver, WCLC 10/15)
- Submitted for approval to UICC/AJCC (early 2016)
- Officially presented (Vienna, WCLC 12/16)
- Effective January 2017

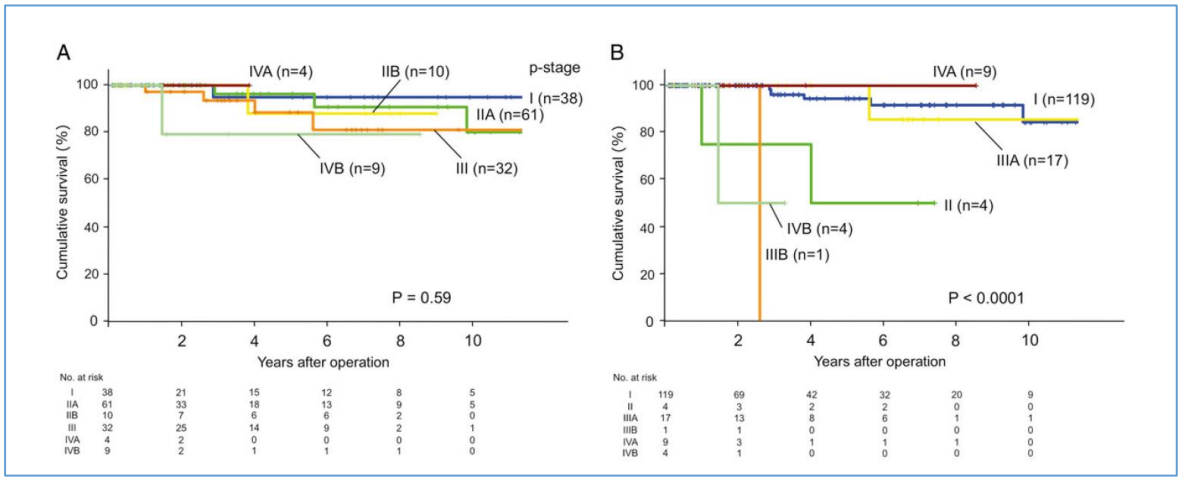
Clinical evaluation of a new tumour–node–metastasis staging system for thymic malignancies proposed by the International Association for the Study of Lung Cancer Staging and Prognostic Factors Committee and the International Thymic Malignancy Interest Group

Takayuki Fukui[a,*], Koichi Fukumoto[a], Toshiki Okasaka[a], Koji Kawaguchi[a], Shota Nakamura[a], Shuhei Hakiri[a], Naoki Ozeki[a], Akihiro Hirakawa[b], Hisashi Tateyama[c] and Kohei Yokoi[a]

N=154

Masaoka vs. TNM stage





The newly proposed system by the IASLC/ITMIG, which was partly based on the current Masaoka-Koga system, appears to be functional and worthwhile, especially in clinical settings and recurrence-free survival analysis.

EJCTS, 2016

Presentation overview

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Thymic tumors

Complete Surgical Resection (R0)

Gold Standard for *cure*

in any Stage

Validated prognostic factor

- Diameter of the tumor
- Staging
- Histology

Detterbeck, JTO 2011

Thymic tumors
Optimal management across the (old) stages

Stage I: Surgery alone

- *Stage II:* Surgery + Adjuvant RT for WHO B2-B3/TC/NETT and R+

- *Stage III:* Resectable: upfront surgery
  R0: None (RT/CT in B2-B3, TC, NETT)
  R+ or ?R : CT/RT
  Unresectable: biopsy + primary CT + Surgery + CT/RT
- *Stage IV:* Primary CT + surgery + CT/RT

Thymic tumors
Resectability rates*

Stage	Average R0 rate	Range
Stage I	100%	100%
Stage II	85%	43%-100%
Stage III	47%	0%-89%
Stage IV	26%	0%-78%

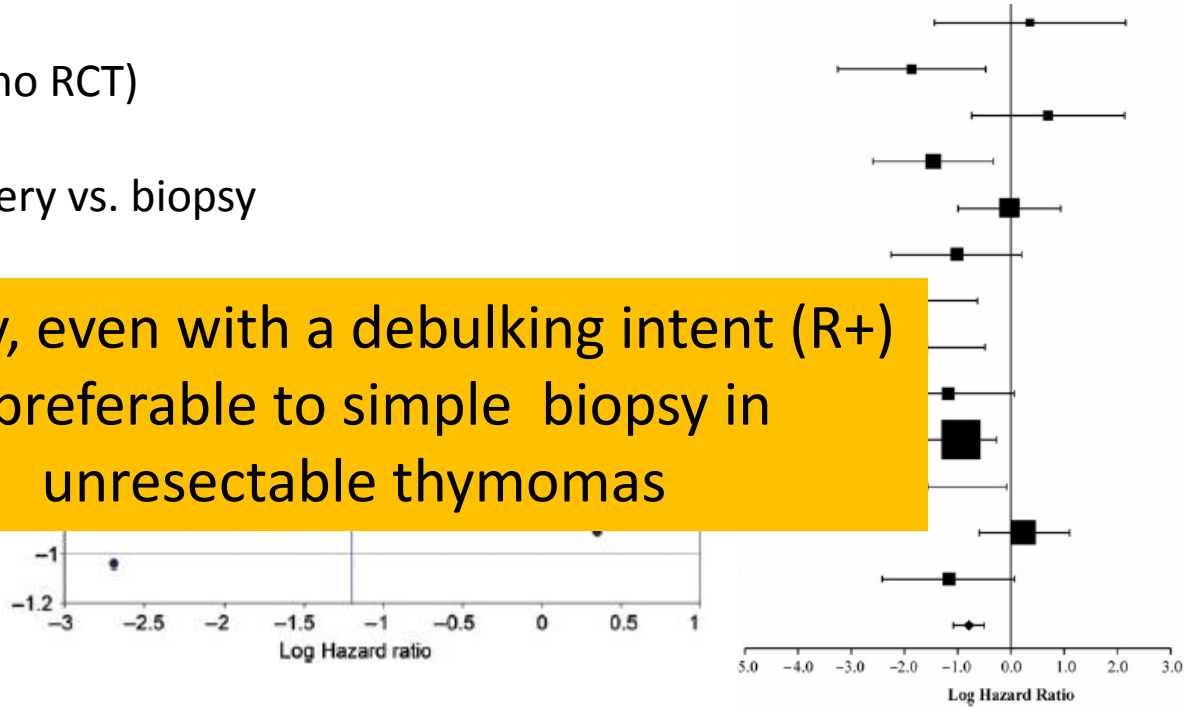
*Detterbeck, ATS 2004

A meta-analysis of debulking surgery versus surgical biopsy for unresectable thymoma†

Masatsugu Hamaji[a,*], Fumitsugu Kojima[a,*], Mitsugu Omasa[a,*], Takashi Sozu[b], Tosiya Sato[b], Fengshi Chen[a], Makoto Sonobe[a] and Hiroshi Date[a]

Observational studies (no RCT)
N=314 pts (13 studies)
HR: 0.45 favouring surgery vs. biopsy

Surgery, even with a debulking intent (R+) is preferable to simple biopsy in unresectable thymomas



EJCTS, 2014

Thymic tumors - Early stages

Is Thymomectomy Alone Appropriate for Stage I (T1N0M0) Thymoma? Results of a Propensity-Score Analysis

Kazuo Nakagawa, MD, Kohei Yokoi, MD, Jun Nakajima, MD, Fumihiro Tanaka, MD, Yoshimasa Maniwa, MD, Makoto Suzuki, MD, Takeshi Nagayasu, MD, and Hisao Asamura, MD

Department of Thoracic Surgery, National Cancer Center Hospital, Tokyo, Japan; Department of Thoracic Surgery, Nagoya University Graduate School of Medicine, Nagoya, Japan; Department of Thoracic Surgery, Graduate School of Medicine, University of Tokyo, Tokyo, Japan; Second Department of Surgery, University of Occupational and Environmental Health, Kitakyushu, Japan; Division of Thoracic Surgery, Kobe University Graduate School of Medicine, Kobe, Japan; Department of Thoracic Surgery, Kumamoto University Graduate School of Medical Sciences, Kumamoto, Japan; Department of Surgical Oncology, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

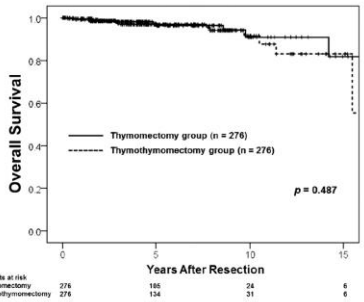


Fig 2. Overall survival curves for thymomectomy and thymothymomectomy groups.

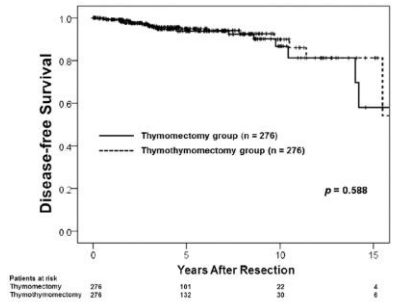
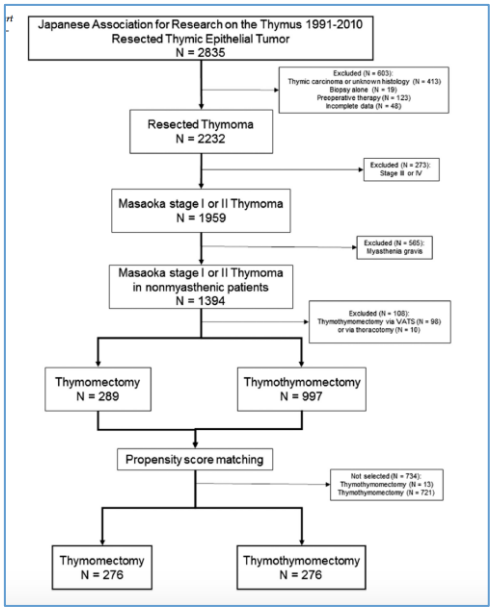


Fig 3. Disease-free survival curves for the thymomectomy and thymothymomectomy groups.



Non-MG patients with stage I thymoma who underwent thymomectomy had oncologic outcomes similar to those of nonmyasthenic patients who underwent thymothymomectomy. Thymomectomy was a less invasive procedure than thymothymomectomy. Thymomectomy alone can be a reasonable treatment option in Stage I thymomas.

Thymic tumors - Early stages

Robotic-Assisted Thymectomy: Surgical Procedure and Results

Jens Rueckert[1] Marc Swierzy[1] Harun Badakhshi[2] Andreas Meisel[3] Mahmoud Ismail[1]

Author	Country	Year	Study interval	Total	MG	Thymoma	Approach	Ports	Complete remission rate (%)	Thymoma recurrence rate (%)
Rückert	Germany	2008	2003–2007	106	95	12	Left	3	42	0
Marulli	Italy	2013	2002–2010	100	100	8	Left	3	28.5	0
Freeman	USA	2011	6 years	75	75	excluded	Left	3	28	n.a.
Schneiter	Switzerland	2012	2004–2011	58	25	20	Left	3	n.a.	11.1
Melfi	Italy	2012	2001–2010	39	19	13	Left	3	n.a.	0
Augustin	Austria	2008	2001–2007	32	32	9	Right	3	n.a.	0
Cerfolio	USA	2011	2009–2010	30	30	n.a.	Right	3	n.a.	n.a.
Castle	USA	2008	2002–2008	26	18	1	Right	4–5	n.a.	n.a.
Goldstein	USA	2010	2003–2008	26	26	5	Right	4	n.a.	n.a.
Tomulesco	Romania	2009	2008–2009	22	22	excluded	Left	3	n.a.	n.a.
Keijzers	Netherlands	2014	2004–2012	138	125	37	Right	3	28.8	2.7
Jun	China	2014	2010–2012	55	n.a.	21	Left/right	4	n.a.	n.a.

Thorac Cardiovasc Surg, 2015

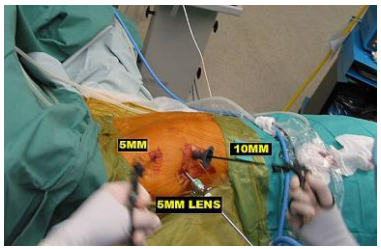
Thymic tumors - Early stages

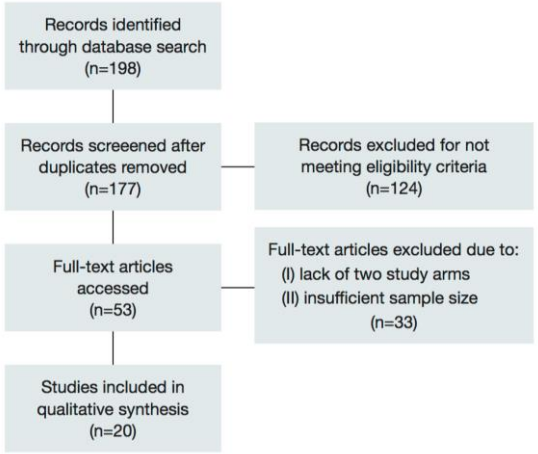
Minimally invasive versus open thymectomy: a systematic review of surgical techniques, patient demographics, and perioperative outcomes

Nicholas R. Hess[1*], Inderpal S. Sarkaria[2*], Arjun Pennathur[2], Ryan M. Levy[2], Neil A. Christie[2], James D. Luketich[2]

Stage I-II: 94% VATS/RATS

Tumor diameter: 29-50mm (VATS/RATS)





In selected patients with MG, or with small sized thymoma (<5 cm.), MIT and RATS-T are comparable to OT, and result in shorter hospital LOS, decreased blood loss, and fewer postop complications. Right or left VATS/RATS approaches appear comparable in outcome.

Ann Cardiothorac Surg, 2016

Thymic tumors - Early stages

Thymic epithelial tumours: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up†

N. Girard[1], E. Ruffini[2], A. Marx[3], C. Faivre-Finn[4] & S. Peters[5], on behalf of the ESMO Guidelines Committee*

[1]Department of Respiratory Medicine, Expert Centre for Thymic Malignancies, Reference Centre for Orphan Pulmonary Diseases, Hôpital Louis Pradel, Hospices Civils de Lyon, Lyon, France; [2]Department of Thoracic Surgery, University of Torino, Turin, Italy; [3]Institute of Pathology, University Medical Centre Mannheim, University of Heidelberg, Mannheim, Germany; [4]Institute of Cancer Sciences, The University of Manchester, Manchester Academic Health Science Centre, The Christie NHS Foundation Trust, Manchester, UK; [5]Department of Medical Oncology, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland

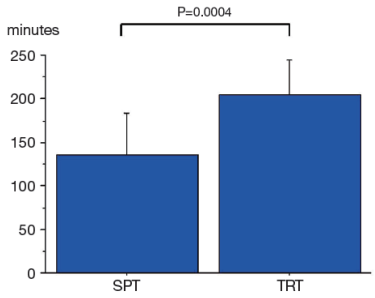
Minimally invasive surgery (VATS/RATS) is an option for clinical stage I and possibly stage II tumours in the hands of appropriately trained thoracic surgeons [IV, C]
Minimally invasive surgery is not recommended for stage III tumours, given the absence of long term follow-up data [IV, D].

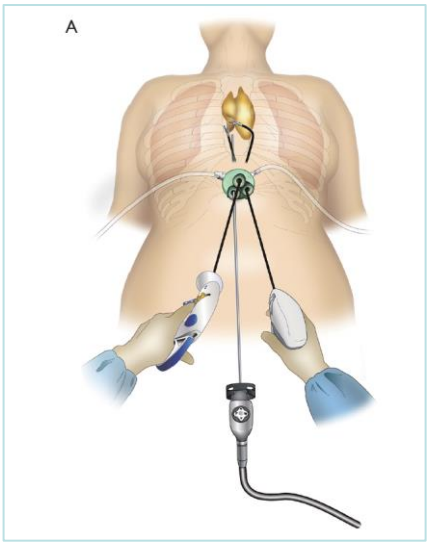
Thymectomy via a subxiphoid approach: single-port and robot-assisted

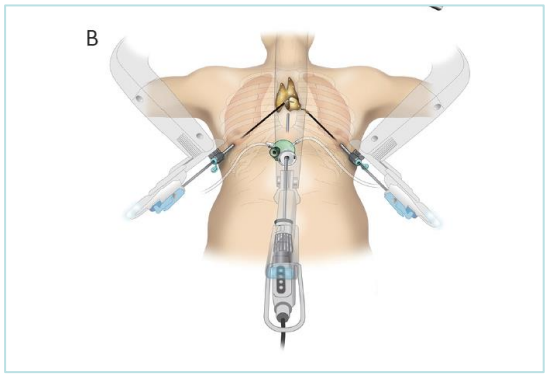
Takashi Suda, Shinji Kaneda, Ayumi Hachimaru, Daisuke Tochii, Ryo Maeda, Sachiko Tochii, Yasushi Takagi

- Single-port subxiphoid thymectomy – SPT
- Dual-port subxiphoid Thymetomy (DPT)
- Trans-subxiphoid robotic thymectomy (TRT)

2011-2015
SPT=72 (4 DPT); TRT:8
25 Thymomas (Masaoka I/II)
POD 4 days.
0% major morbidity rate; 0% mortality







The subxiphoid approach is safe for thymectomy. Selecting the appropriate subxiphoid approach on the basis of the degree of progression of the thymoma is imperative.

ESTS prospective database: types of surgical approaches

Type of surgical approach	No.	%
Simple	159	74%
Extended	12	6%
MIS	42	20%
Total	213	100%

ESTS prospective database: surgical approaches by the type of thymic tumors

Type of thymic tumor	Simple	Extended	MIS
Neuroendocrine thymic tumour (NETT)	3 (2%)	1 (10%)	0
Thymic carcinoma	15 (11%)	2 (20%)	0
Thymoma	120 (87%)	7 (70%)	30 (100%)
Total	138 (100%)	10(100%)	30 (100%)

Increased rate of extended procedures and no MIS procedure in thymic carcinoma

ESTS prospective database: surgical approaches by Masaoka stage

Masaoka	Simple	Extended	MIS
I-II	104 (74%)	4 (44%)	31 (97%)
III	22(16%)	4 (44%)	1 (3%)
IV	13 (10%)	1 (11%)	0
Total	139 (100%)	9 (100%)	32 (100%)

Increased rate of extended procedures and very low rate of MIS in advanced stages

Thymic tumors – invasive stages

TABLE 1. Masaoka-Koga Staging System

Stage	Definition
I	Grossly and microscopically completely encapsulated tumor
	...issue,
III	Macroscopic invasion into neighboring organ (i.e., pericardium, great vessel, or lung)
IVa	Pleural or pericardial metastases
b	Lymphogenous or hematogenous metastasis

Pathol Int 1994;44:359–367.

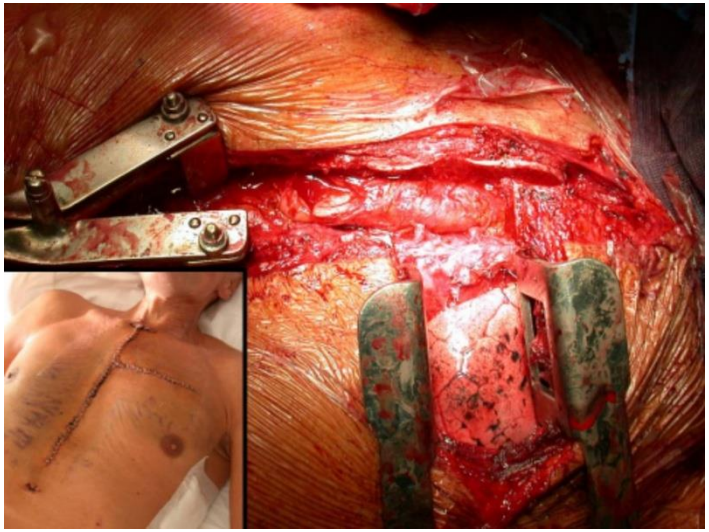
Locally advanced thymic tumors
10-25% of the total° (<10% Stage IVa)*
Higher prevalence in thymic carcinoma/NETT

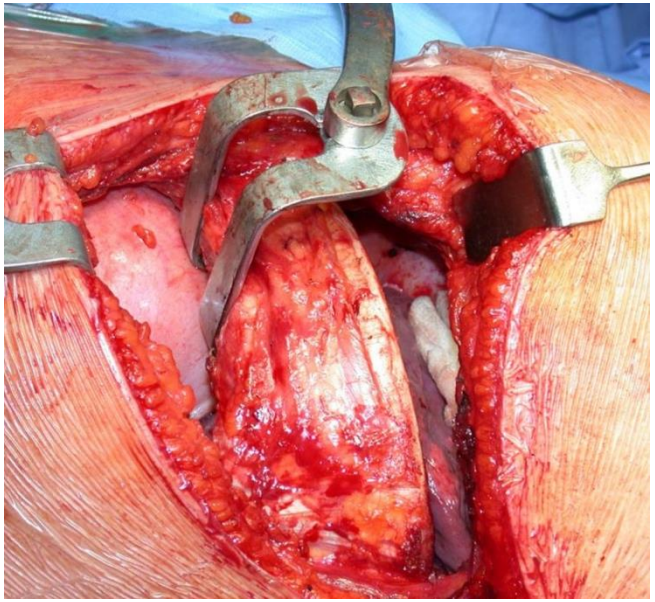
°10% in ITMIG/IASLC DB
*4% in ITMIG/IASLC DB

Thymic tumors – Invasive stages

Surgical accesses

Median sternotomy
Extended approaches (hemiclamshell, clamshell, sternothoracotomy)
Second lower thoracotomy
No minimally invasive techniques

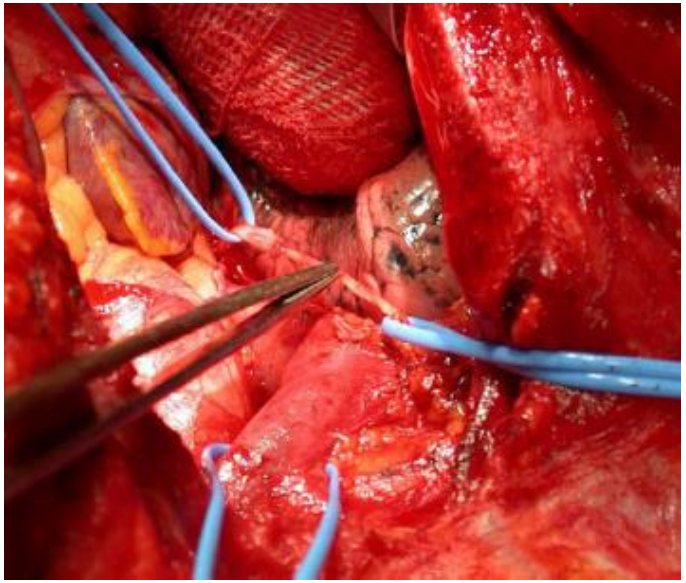




Locally advanced thymic tumors
Surgical issues

Stage III thymic tumors: phrenic nerve involvement

- The phrenic nerve should be preserved (particularly in MG pts)
- Unilateral PR resection is acceptable
- Bilateral PR resection is to be avoided
- Diaphragmatic plication is recommend by some authors after PR resection

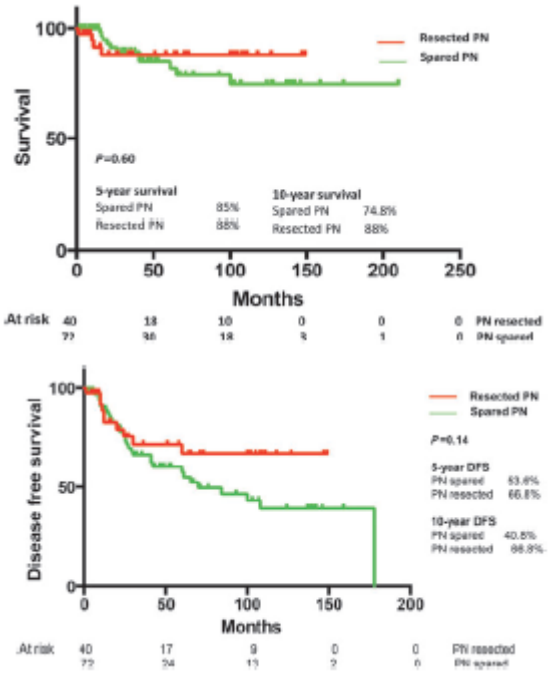


Locally advanced thymic tumors
Surgical issues

Is sacrifying the phrenic nerve during thymoma resection worthwhile?†

Sarah Hamdi[a,b], Olaf Mercier[a,b,*], Elie Fadel[a,b], Sacha Mussot[a,b], Dominique Fabre[a,b], Maria Rosa Ghigna[b,c], Vincent de Montpreville[b,c], Benjamin Besse[b,d], Cécile Le Pechoux[b,c], François Leroy Ladurie[a,b], Thierry Le Chevalier[a,b,d] and Philippe Dartevelle[a,b,e]

114 pts (1988-2012) with PN involvement
Masaoka III (N=65), or IVa (N=49)
PN spared (N=73) or removed (N=41)
Lower RR when PN was removed
Similar OS rates in both groups

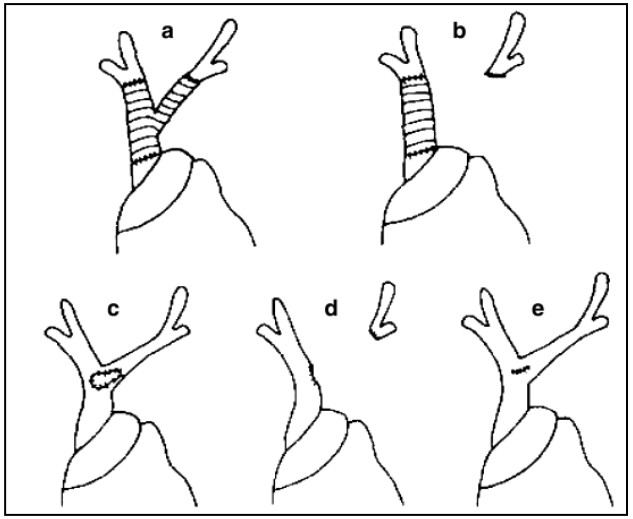


PN sparing is advisable in high-risk thymoma pts, although with an associated higher recurrence rate

EJCTS, 2014

Locally advanced thymic tumors
Surgical issues

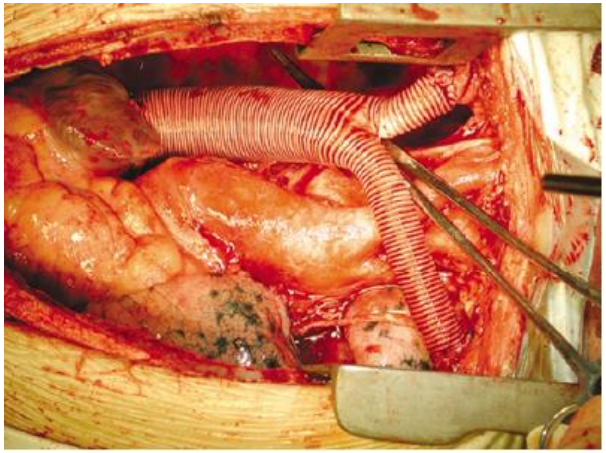
Great vessel (venous) involvement



- Consider induction (CT better than CT/RT)
- Left innominate vein (ligation) acceptable
- Superior Vena Cava (SVC)
  - Tangential resection (<25% circumference)
  - Resection/reconstruction (auto/bovine pericardium, auto vein, PTFE)
- Resection of phrenic nerve (no major consequences); consider diaph plication
- R0 resection advisable, a small residual is justified in high-risk resection

Mortality/morbidity of SVC resection in thymic tumors

Hemodynamic instability
SVC thrombosis
Cerebral edema



Wright, JTO 2010

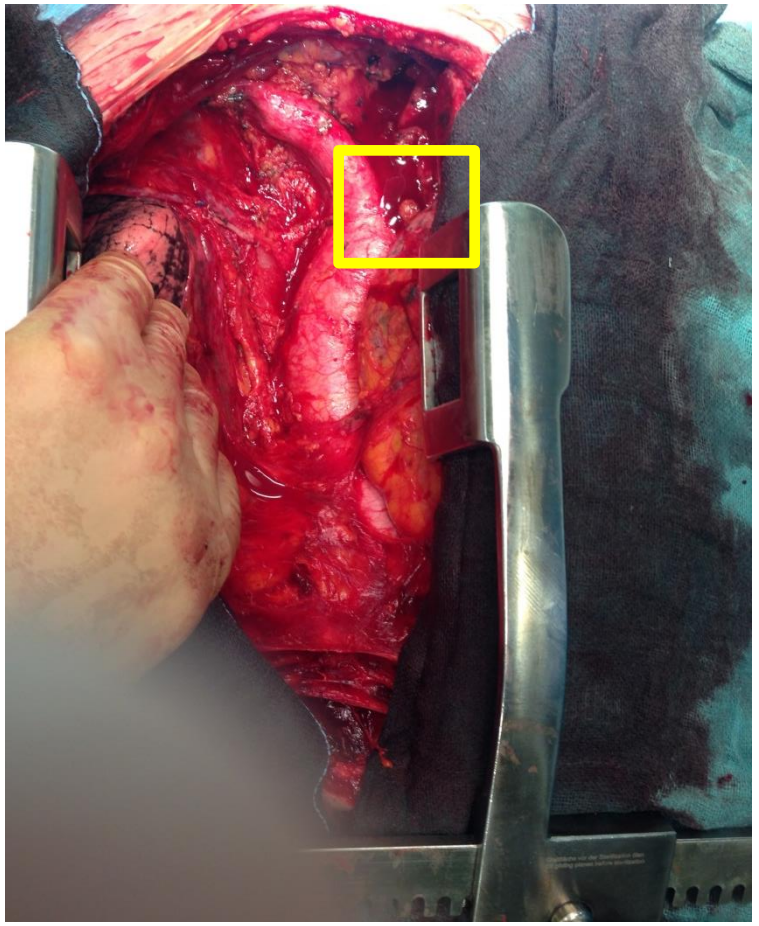
TABLE 1. Results of SVC Resection in Thymic Tumors

References	No. of Cases (Thymic/Total)	Operative Mortality (%)	Graft Patency	Survival
Shintani et al.[7]	11/18	0	7/10	NS
Chen et al.[8]	11/15	0	15/15	14/15 alive with 35 mo follow-up
Spaggiari et al.[9]	9/70	4 (7.7)	64/70	45%, 5 yr
Lanuti et al.[10]	3/19	1 (5)	17/19	56%, 5 yr
Leo et al.[11]	8/72	2 (2.8)	70/72	NS
Okereke et al., in press	10/38	2 (5)	36/38	27/38 alive

0%-4% mortality
50% 5-Y survival

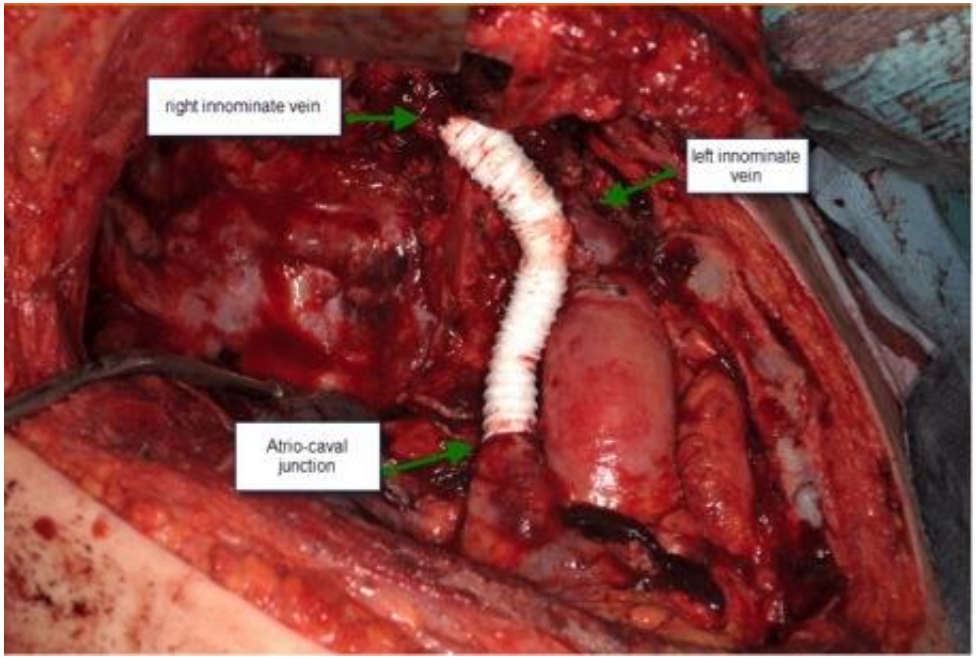
Locally advanced thymic tumors
Surgical issues

Thymoma Stage IIIa
Left innominate vein ligation



Locally advanced thymic tumors
Surgical issues

Thymoma Stage IIIa
SVC resection/reconstruction



Courtesy Prof. Weder

Thymic tumors

Locally advanced thymic tumors
Stage III-IVa

….a multidisciplinary approach….



Stage III thymoma
Results of Upfront Surgery

Author (Year)	Patients (n)	5-Year Survival Rate (%)	Recurrence Rate (%)	Histology	Postop. Radiotherapy
Kruger (1988)	12	57	33	Thymoma	Yes
Curran (1988)	36	69	31	Thymoma	Yes/no
Nakahara (1988)					Yes
Urgesi (1990)					Yes
Jackson (1991)					Yes
Hanjuda (1992)	18	70	28	Thymoma	Yes
Latz (1997)	14	65	43	Thymoma + carcinoma	Yes
Gripp (1998)	30	60	55	Thymoma	Yes
Wilkins (1999)	42	55	~24	Thymoma + carcinoma	Yes/no
Myojin (2000)	32	71	38	Thymoma + carcinoma	Yes/no
Lardinois (2000)	19	85	54	Thymoma + carcinoma	Yes/no
Ogawa (2002)	25	50	44	Thymoma	Yes

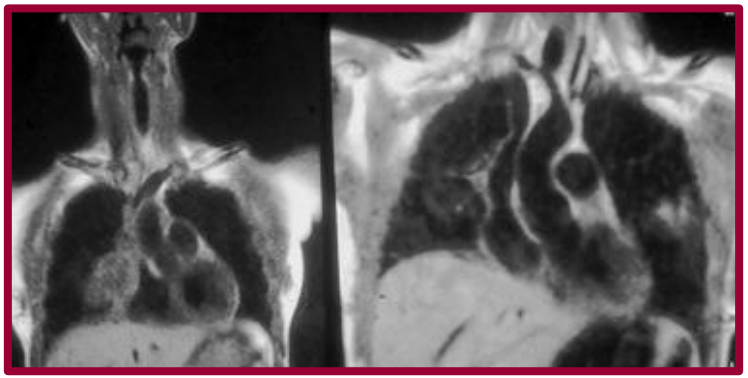
Good but not exceptional

67%

34%

Thymic tumors: Stage III-IVa

Primary chemotherapy (PC)*



- Increased compliance before surgery
- Increased chance of receiving a R0 resection
- Invasive tumors deemed unresectable by the thoracic surgeon
- Chemotherapy (+ Radiotherapy?), cisplatin-based regimens
- Postoperative XRT and Chemotherapy

*Chemotherapy delivered prior to another focal treatment (surgery or XRT), ITMIG, 2010, better than previous terms (induction, neoadjuvant, preoperative)

Multimodality treatments in locally advanced thymic tumors (Stage III-IV)

Study year	No	Stage	Induct	Adjuvant	% Rx Response	% R0	%pCR	5-y surv
Venuta 2003	45	III	PEEpi	RT/Ch	80%	86%	7%	80%
Kim 2004	22		CAPPr	RT/Ch	77%	76%	9%	95%
Lucchi 2005	36	III-IVA	PEEpi	RT		80%		76% (III) 43% (Iva)
Wright 2008	10	III-IVA	PE+XRT	Ch	40%	80%	20%	69%
Kunitoh 2009	21	III	CODE	RT/Ch	62%	43%		80%
Marulli 2011	94	III	PEV, ADOC, PAC	RT		74%	6%	62% (10Yrs)
Park 2013	27	III-IV	Cis + Doc	RT/CT	63%	79%		79% (4-Y)
Modh 2014	87	III-IV	CAP	RT				80%
Leuzzi 2016	88	III		RT				83%
Average					**92%**	**72%**	**17%**	**78%**

Multimodality therapy for locally advanced thymomas: A propensity score–matched cohort study from the European Society of Thoracic Surgeons Database

Giovanni Leuzzi, MD,[a] Gaetano Rocco, PhD,[b] Enrico Ruffini, PhD,[c] Isabella Sperduti, MS,[d] Frank Detterbeck, PhD,[e] Walter Weder, MD,[f] Federico Venuta, PhD,[g] Dirk Van Raemdonck, PhD,[h] Pascal Thomas, PhD,[i] Francesco Facciolo, MD,[j] and the ESTS Thymic Working Group

1990-2010
370 Stage III Thymomas
88 IT, 245 AT
AT was associated with improved survival

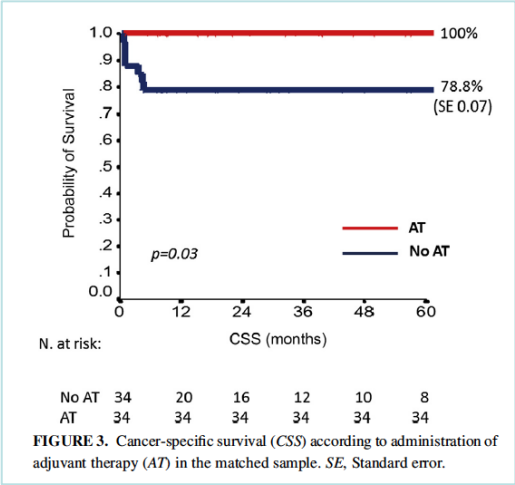
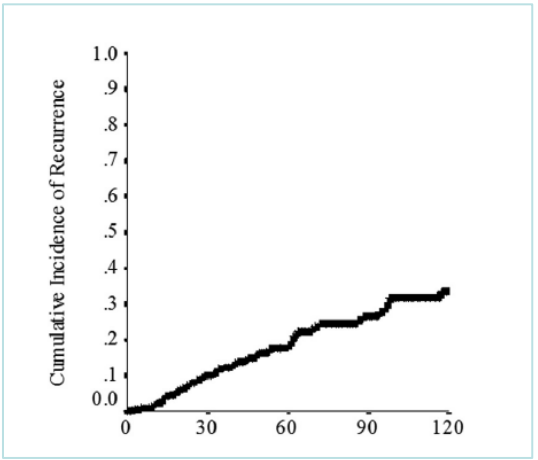


FIGURE 3. Cancer-specific survival (*CSS*) according to administration of adjuvant therapy (*AT*) in the matched sample. *SE*, Standard error.



Role of IT unclear. AT is effective in prolonging OS and CSS in T3 and <5cm

JTCVS, 2016

Postoperative radiotherapy

The Effectiveness of Postoperative Radiotherapy in Patients With Completely Resected Thymoma: A Meta-Analysis

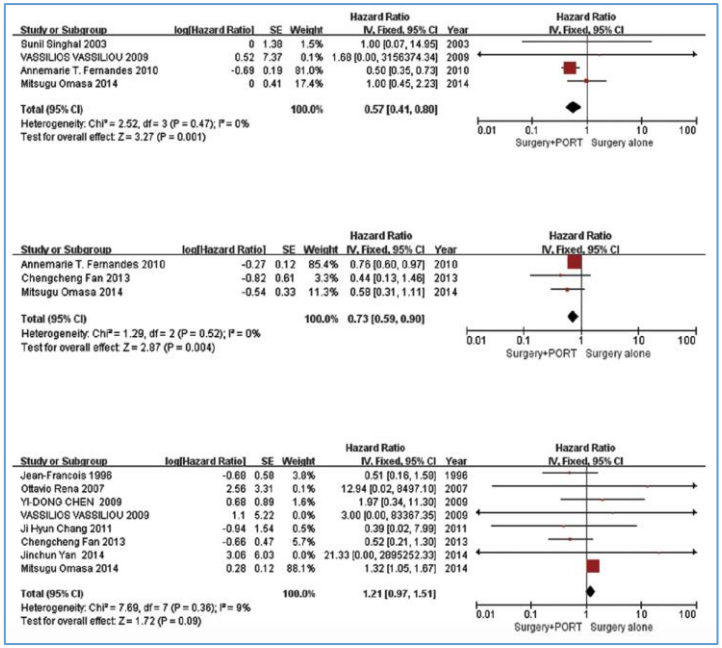
Dong Zhou, MD,* Xu-Feng Deng, MD,* Quan-Xing Liu, MD, Hong Zheng, MD, Jia-Xin Min, MD, PhD, and Ji-Gang Dai, MD, PhD

Department of Thoracic Surgery, Xinqiao Hospital, and Institute of Immunology of PLA, Third Military Medical University, Chongqing, China

Table 1. Demographic Data

Study	Publication Year	Source of Patients	Follow-Up (Months) Median	Follow-Up (Months) Range	Patients S Alone	Patients S + RT	Outcomes Reported	Multivariate Analysis	Tumor Stages
Regnard et al	1996	France	96	1–180	24	90	DFS	Yes	I/II/III/IV
Mangi et al	2002	USA	90	1–336	35	14	DSS	Yes	II
Kondo and Monden	2003	Japan	NR	1–120	35	105	OS	Yes	III/IV
Singhal et al	2003	USA	70.3	1–120	47	23	OS	Yes	I/II
Mangi et al	2005	USA	94	2–268	7	38	DSS	Yes	III
Rena et al	2007	Italy	91	9–170	31	25	DFS	Yes	II
Vassiliou et al	2009	Greece	69	2–212	15	26	OS/DFS/DSS	Yes	I/II/III/IV
Chen et al	2009	China	63	2–303	41	66	DFS/DSS	Yes	II
Forquer et al	2010	USA	NR	1–60	315	585	OS/DSS	Yes	I/II/III
Fernandes et al	2010	USA	65	1–361	346	669	OS	Yes	I/II/III/IV
Chang et al	2011	Korea	58.5	6–231	17	59	DFS	Yes	II/III
Fan et al	2013	China	50	5–360	12	53	OS/DFS/DSS	Yes	III
Yan et al	2014	USA	49	NR	18	22	OS/DFS	Yes	II/III
Omasa et al	2014	Japan	56.8	0–258	784	321	OS/DFS	Yes	II/III

DFS = disease- free survival; DSS = disease-specific survival; NR = not reported; OS = overall survival; RT = radiation therapy; S = surgical treatment.



PORT for R0 resected thymoma had no advantage in all stages of disease, but it definitely increased the rate of OS in stage II and III thymoma after complete resection. On the basis of this study, PORT will be beneficial in patients with stage II and III thymoma after R0 resection.

ATS, 2016

Thymic tumors: Stage IVa

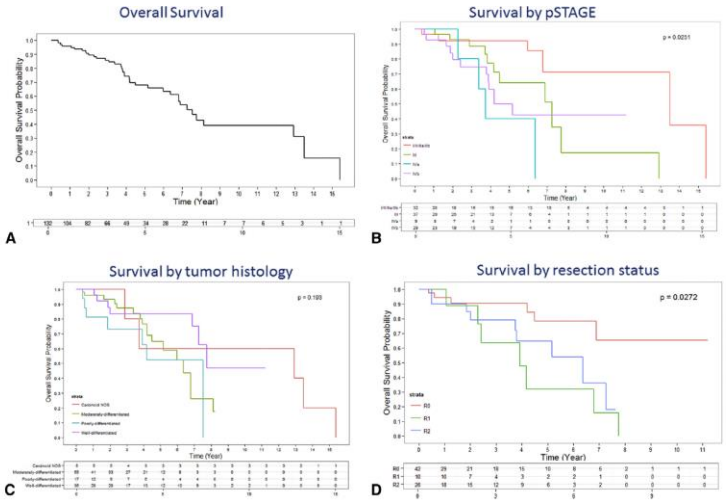
Author	Year	n	5 – year Survival	10 – year Survival
Nakahara	1988	15	47 %	47 %
Maggi	1991	21	59 %	40 %
Pan	1994	12	41 %	22 %
Wilkins	1999	5	40 %	40 %
Kondo	2003	67	40 %	67 %
Nakagawa	2003	11	47 %	47 %
Lucchi	2005	16	---	46 %
Wright	2006	5	75 %	50 %
Huang	2007	18	78 %	65 %
Ishikawa	2009	11	81%	70%
Okuda(JART)	2014	136	86%	72%
Average			**54%**	**40%**

Thymic tumors
Thymic carcinoma

Author, year	No.Pts	Surgery	Chemo/XRT	Local control	5-Y Surv	Median Surv (Mo.)	Prognostic factors
Hsu 2002	26	R0 65% R+ 34%	XRT	91%	77% R0 82%		Masaoka R0 + XRT
Kondo 2003	186	R0 50% R+ 20%	Chemo/XRT	49%	50% R0 72%		R0 resection
Liu 2002	38	R0 21% R+ 79%	Chemo/XRT		27%	24 R0 35	R0, Masaoka
Lucchi 2001	13	R0 46% R+ 54%	Chemo/XRT		61%	38	Induction Chemo
Nakamura 2000	10	None	Chemo/XRT	0%		11	
Mayer 1999	6	R0 17% R+ 83%	XRT		22%		
Ogawa 2002	40	R0 40% R+ 27%	Chemo/XRT	100%	38%		R0 + XRT
Filosso 2014	40	R0 90%	Chemo/XRT		75%		R0; No recurrence
Song 2014	76	R0 78%	Chemo/XRT		60%		R0; Masaoka
Ruffini (ESTS) 2014	229	R0 69%	Chemo/XRT		61%		MDT; Masaoka; R0
Average					**52%**	**24**	

Outcome of primary neuroendocrine tumors of the thymus: A joint analysis of the International Thymic Malignancy Interest Group and the European Society of Thoracic Surgeons databases

Pier Luigi Filosso, MD,[a] Xiaopan Yao, PhD,[b] Usman Ahmad, MD,[c] Yilei Zhan, MS,[b] James Huang, MD,[c] Enrico Ruffini, MD,[a] William Travis, MD,[d] Marco Lucchi, MD,[e] Andreas Rimner, MD,[f] Alberto Antonicelli, MD,[g] Francesco Guerrera, MD,[a] and Frank Detterbeck, MD,[g] and the European Society of Thoracic Surgeons Thymic Group Steering Committee



1984-2012 (ITMIG + ESTS)
205 pts
54% R0 rate
5-year OS: 68%

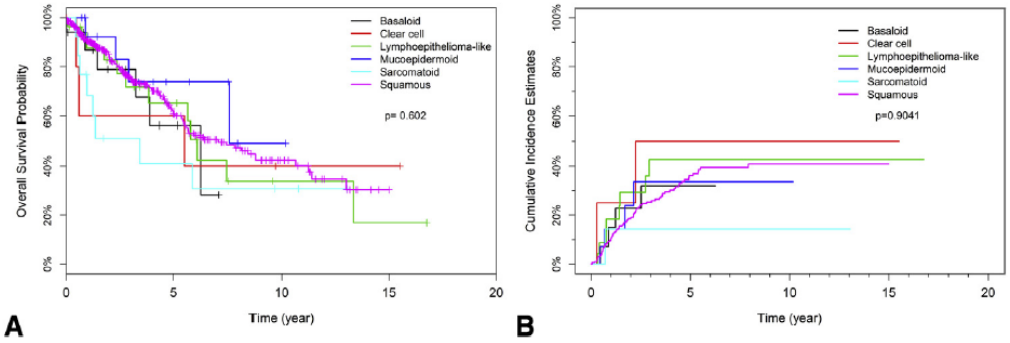
- Rare and very aggressive tumors, poor prognosis .
- Surgical tumor resection is the treatment of choice
- Advanced/unresectable tumors, are predictors of negative outcome.
- Chemotherapy/radiotherapy both in induction and in adjuvant settings were not found to influence OS in this series.

JTCVS, 2015

Thymic carcinoma outcomes and prognosis: Results of an international analysis

Usman Ahmad, MD,[a] Xiaopan Yao, PhD,[b,c] Frank Detterbeck, MD,[d] James Huang, MD,[a] Alberto Antonicelli, MD,[d] Pier Luigi Filosso, MD,[e] Enrico Ruffini, MD,[e] William Travis, MD,[f] David R. Jones, MD,[a] Yilei Zhan, MD,[b] Marco Lucchi, MD,[g] and Andreas Rimner, MD[h]

1984-2012 ITMIG + ESTS
1042 TC
78% Masaoka II-IV
61% R0 rate
PORT in 60%
5-year OS 65%



Most thymic carcinomas present at advanced stages
Aggressive surgical approach + RT is useful
Early stage, R0 and PORT are associated with prolonged OS

JTCVS, 2015

Presentation overview

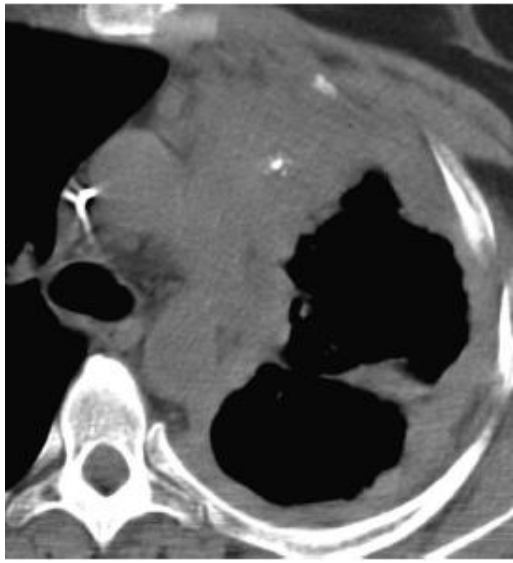
- The TNM-based staging system for thymic tumors
- Update in surgery for early and locally advanced thymic tumors
- Update in advanced disease and thymic tumors guidelines
- Update on the ESTS thymic group
- Conclusions

Thymic tumors
Stage IVa

Pleural implants
- Single
- Multiple discrete
- Diffuse (MPM-like)

Pericardial implants

Anterior mediastinal nodes

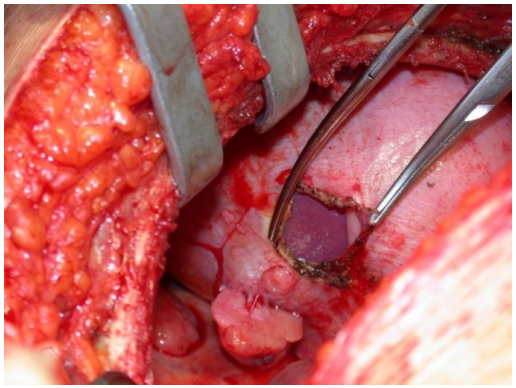


Complete resection rate varies among the different series depending upon the experience of the centres (30%-88%)

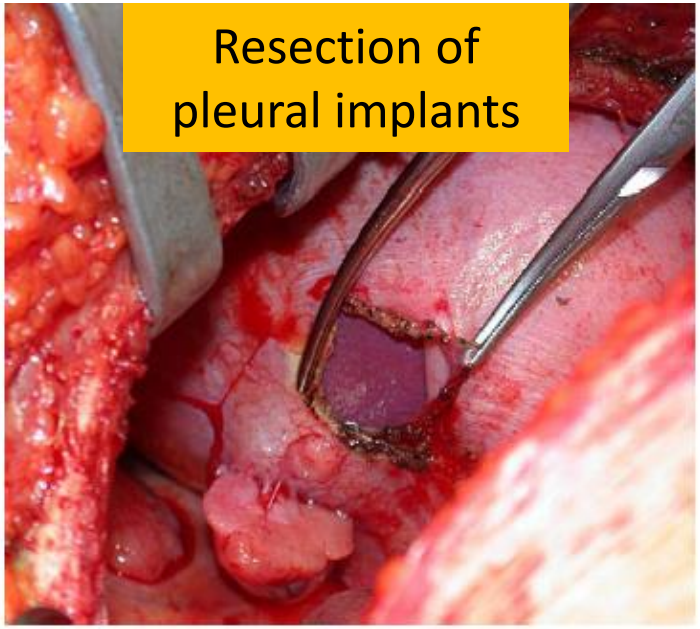
Thymic tumors: Stage IVA

Surgical options

1. Pleural implants resection
2. Total pleurectomy
3. EPP (extrapleural pneumonectomy)
4. Novel treatments (intracavitary hyperthermic CT, photodynamic therapy, etc)

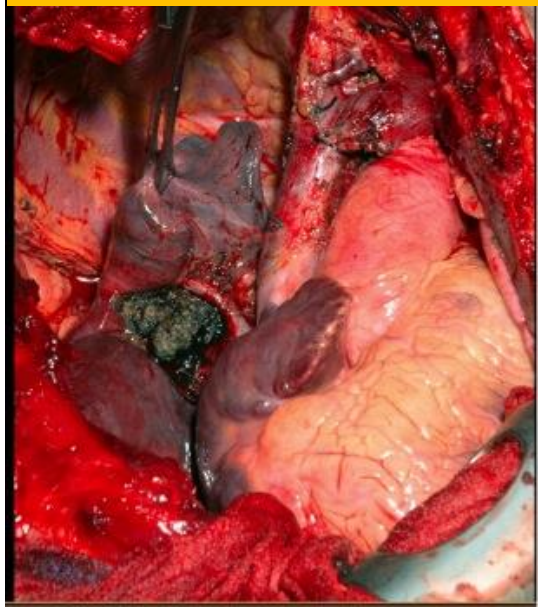


Stage IVa tumors



Resection of pleural implants

Extrapleural pneumonectomy (EPP)



Hyperthermic intrathoracic chemotherapy in advanced/recurrent thymomas

Pleural recurrence of thymoma: surgical resection followed by hyperthermic intrathoracic perfusion chemotherapy[†]

Marcello Carlo Ambrogi[a], Stylianos Korasidis[a,*], Marco Lucchi[b], Olivia Fanucchi[b], Silvia Giarratana[a], Franca Melfi[b] and Alfredo Mussi[a]

13 patients, 2005-2012
R0 in 12 cases (92%)
Median survival 58 months - 5-y (actuarial): 92%

Cytoreductive surgery combined with hyperthermic intrapleural chemotherapy to treat thymoma or thymic carcinoma with pleural dissemination

Onco Targets Ther, 2013

4 patients, 2008-2010
42-43°C (core T 39°C) – 2 hours

EJCTS, 2015

clinical practice guidelines

Annals of Oncology 26 (Supplement 5): v40–v55, 2015
doi:10.1093/annonc/mdv277

Thymic epithelial tumours: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up†

N. Girard[1], E. Ruffini[2], A. Marx[3], C. Faivre-Finn[4] & S. Peters[5], on behalf of the ESMC Committee*

[1]*Department of Respiratory Medicine, Expert Centre for Thymic Malignancies, Reference Centre for Orphan Pulmonary Diseases, Hôpital Loui Lyon, Lyon, France;* [2]*Department of Thoracic Surgery, University of Torino, Turin, Italy;* [3]*Institute of Pathology, University Medical Centre Mann Heidelberg, Mannheim, Germany;* [4]*Institute of Cancer Sciences, The University of Manchester, Manchester Academic Health Science Centre, Trust, Manchester, UK;* [5]*Department of Medical Oncology, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland*

Table 8. Levels of evidence and grades of recommendation (adapted from the Infectious Diseases Society of America-United States Public Health Service Grading System[a])

Levels of evidence	
I	Evidence from at least one large randomised, controlled trial of good methodological quality (low potential for bias) or meta-analyses of well-conducted randomised trials without heterogeneity
II	Small randomised trials or large randomised trials with a suspicion of bias (lower methodological quality) or meta-analyses of such trials or of trials with demonstrated heterogeneity
III	Prospective cohort studies
IV	Retrospective cohort studies or case–control studies
V	Studies without control group, case reports, experts opinions
Grades of recommendation	
A	Strong evidence for efficacy with a substantial clinical benefit, strongly recommended
B	Strong or moderate evidence for efficacy but with a limited clinical benefit, generally recommended
C	Insufficient evidence for efficacy or benefit does not outweigh the risk or the disadvantages (adverse events, costs, …), optional
D	Moderate evidence against efficacy or for adverse outcome, generally not recommended
E	Strong evidence against efficacy or for adverse outcome, never recommended

[a]By permission of the Infectious Diseases Society of America [89].

Table 7. Summary of recommendations

Diagnosis

- Thymic epithelial tumours are classified according to the WHO histopathological classification.
- Although designed for surgical resection specimen, the WHO classification may be used for small biopsies [V, A].
- Immunohistochemistry with anti-CD117/KIT and anti-CD5 antibodies is useful to establish the thymic primary nature of a mediastinal carcinoma [V, A].
- Each component of heterogeneous tumours may be quantified by 10% increments [V, C].
- Consultation with a second pathologist or referral of the case to a thymic tumour pathology panel is recommended whenever there is any diagnostic difficulty.
- Oncogenetic assessment should be carried out in case of familial thymic epithelial tumour, looking especially at MEN1.

Imaging and diagnostic tests

- Thymoma is the first diagnosis to consider when facing a mediastinal mass associated with autoimmune disease [IV, A].
- The diagnosis of any thymic epithelial tumour relies on making the differential diagnosis with other anterior mediastinal tumours and non-malignant thymic lesions.
- Standard imaging for thymic tumours is i.v. contrast-enhanced (CT) scan of the thorax [IV, A].
- MRI is recommended to differentiate thymic tumour from hyperplasia whenever CT scan is doubtful, or in case of cystic lesion [IV, B].
- PET scan is generally not recommended to assess thymic masses [IV, C].
- Therapeutic intervention is usually not required if the lesion is <30 mm, given a low risk of progression or thymic malignancy [III, D].
- Systematic immunological check-up is recommended, including complete blood cells count with reticulocytes and serum protein electrophoresis, as well as anti-acetylcholine receptor and anti-nuclear antibodies tests [V, A].

Need for a biopsy

- Pretreatment biopsy is not required if the diagnosis of thymic epithelial tumour is highly suspected and upfront surgical resection is achievable [IV, E].
- Biopsy is required in all other clinical situations [IV, A]; approaches may consist of percutaneous core-needle biopsy or incisional surgical biopsy through mediastinotomy or mini-thoracotomy. Fine-needle aspiration is not recommended [IV, D].

Staging

- Thymic epithelial tumours are routinely staged according to the Masaoka-Koga staging system [III, A]. Masaoka-Koga staging is a surgical pathology system that is assessable only after surgical resection of the tumour.
- Staging according to proposed IASLC/ITMIG TNM system is optional [V, C].
- The Masaoka-Koga staging system should remain the standard for the routine management of patients, pending the approval of the AJCC and UICC [III, A].

Risk assessment

- The management of autoimmune syndromes should be integrated in the oncological management of these patients [V, A].

Management of resectable disease

- The treatment strategy for thymic epithelial tumour is primarily based on whether the tumour may be resected upfront or not [IV, A].
- The assessment of resectability is mostly based on the surgeon's expertise; it is recommended to discuss indications for surgery in a multidisciplinary tumour board setting [V, B].
- If complete resection is deemed to be achievable upfront, surgery represents the first step of the treatment [IV, A].

Surgery principles

- Standard approach is median sternotomy [IV, A].
- Complete thymectomy including the tumour, the residual thymus gland and perithymic fat, is preferred [IV, B].
- Thymomectomy alone—leaving residual thymic tissue and perithymic fat behind—is an option in stage I tumours in non-myasthenic patients [IV, C].
- If the tumour is widely extensive invasive (stage III/IV), *en bloc* removal of all affected structures, including lung parenchyma (usually through limited resection), pericardium, venous great vessels, nerves and pleural implants, should be carried out [IV, A].
- Areas of uncertain margins are marked with clips to allow precise delivery of postoperative radiotherapy [IV, B]: those areas are also designated on the resection specimen.
- Phrenic nerve preservation does not affect OS but increases the risk of local recurrence [IV, C].
- Frozen sections to assess tumour involvement of resection margins are not recommended [V, D].
- Minimally invasive surgery is an option for presumed stage I–II tumours in the hands of appropriately trained thoracic surgeons [IV, C].
- The choice for minimally invasive resection should not jeopardise or change the principles that are deemed appropriate for an open approach, especially the achievement of complete resection that may ultimately require switching to an open procedure [V, A].
- Minimally invasive surgery is not recommended for stage III tumours, given the absence of long-term follow-up data [IV, D].
- Routine removal of anterior mediastinal and anterior cervical nodes is recommended [IV, A].
- Systematic sampling of intrathoracic sites is encouraged in stage III/IV tumours [V, B].
- Systematic lymphadenectomy (N1 + N2) is strongly recommended in case of thymic carcinoma due to the high rate of lymphatic spread [V, B].

Continued

Ann Oncol, 2015

clinical practice guidelines

Annals of Oncology 26 (Supplement 5): v40–v55, 2015
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Thymic epithelial tumours: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up†

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[1]Department of Respiratory Medicine, Expert Centre for Thymic Malignancies, Reference Centre for Orphan Pulmonary Diseases, Hôpital Louis Pradel, Hospices Civils de Lyon, Lyon, France; [2]Department of Thoracic Surgery, University of Torino, Turin, Italy; [3]Institute of Pathology, University Medical Centre Mannheim, University of Heidelberg, Mannheim, Germany; [4]Institute of Cancer Sciences, The University of Manchester, Manchester Academic Health Science Centre, The Christie NHS Foundation Trust, Manchester, UK; [5]Department of Medical Oncology, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland

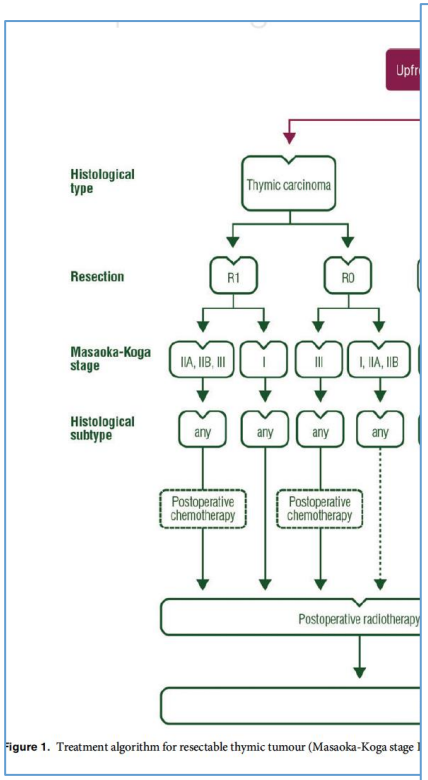
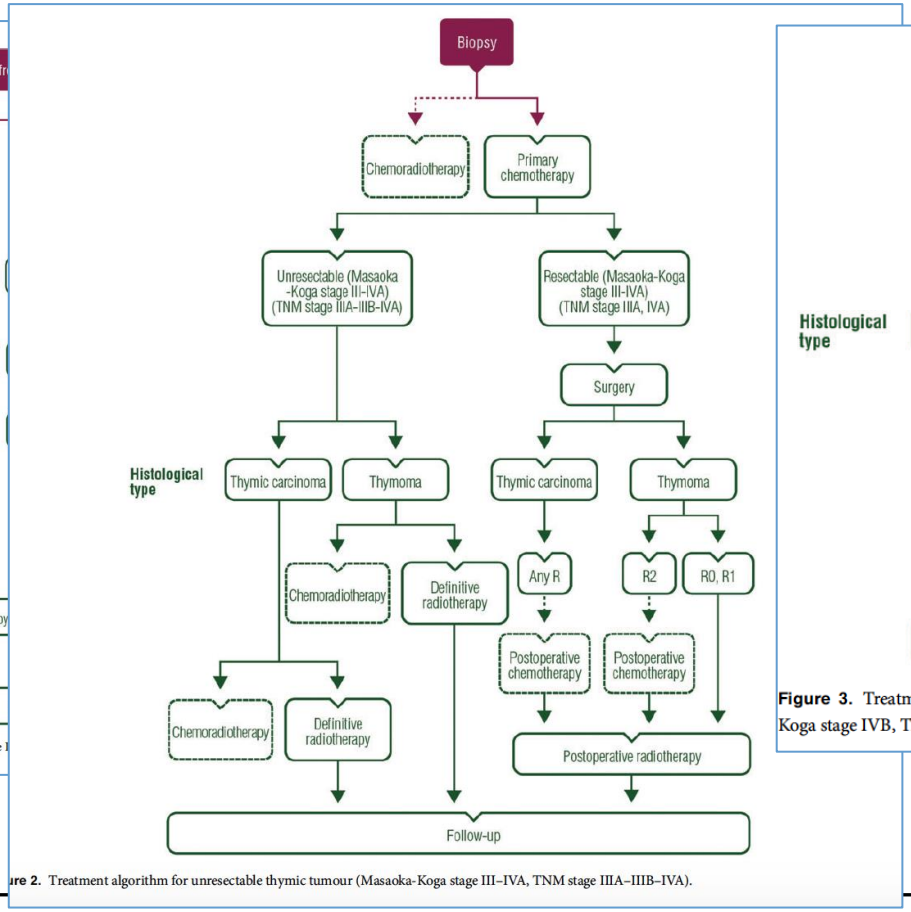


Figure 1. Treatment algorithm for resectable thymic tumour (Masaoka-Koga stage I



ure 2. Treatment algorithm for unresectable thymic tumour (Masaoka-Koga stage III–IVA, TNM stage IIIA–IIIB–IVA).

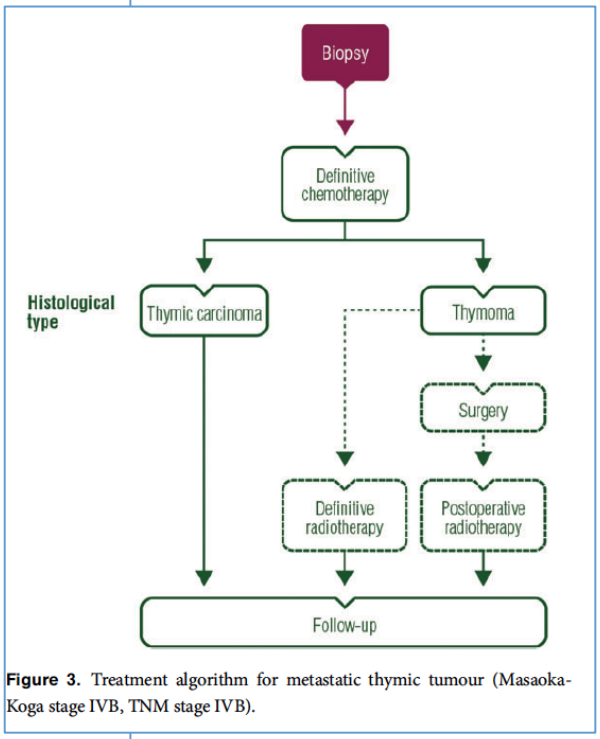


Figure 3. Treatment algorithm for metastatic thymic tumour (Masaoka-Koga stage IVB, TNM stage IVB).

Ann Oncol, 2015

Presentation overview

- The TNM-based staging system for thymic tumors
- Update in surgery for invasive tumors
- Update in advanced disease and thymic tumors guidelines
- Update on the ESTS thymic group
- Conclusions

THE ESTS DATABASE

- ✓ Founded 2001
- ✓ Participation is free / voluntary. Must be ESTS members
- ✓ Online version launched July 2007
  - Run on a dendrite platform
  - Data security / backups
- ✓ Cooperation with national registries
  - French national EPITHOR
  - Collaboration ESTS / STS

    ➔ Standardization of variables definitions and terminology (Ann Thorac Surg)

THE ESTS DATABASE

- Online
- Free to all ESTS members
- All thoracic surgery operations are included
- Multiple outcome and process indicators
- Standardized risk factors and outcomes
- Possibility to export data for internal usage

THE ESTS DATABASE

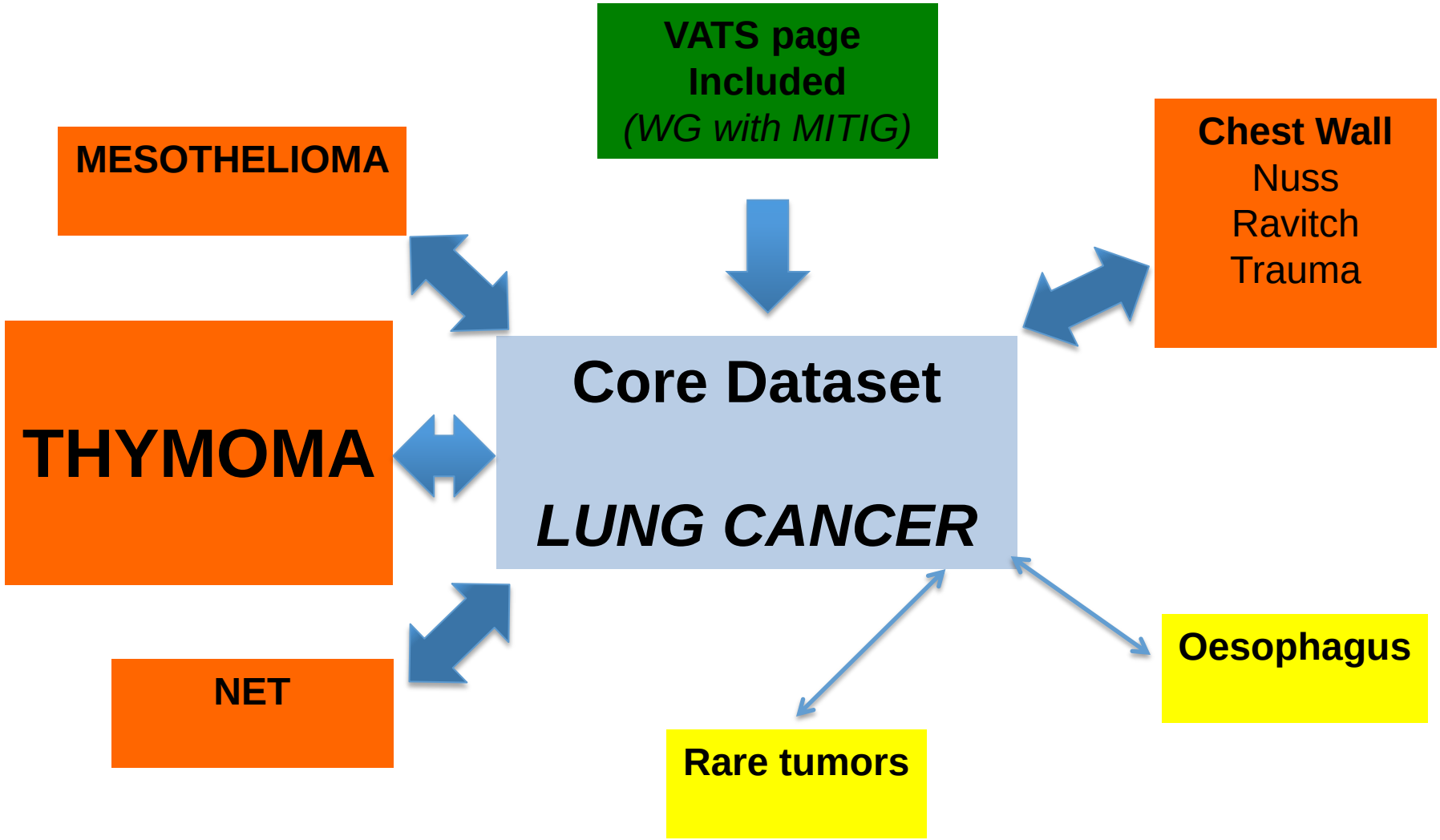
- ✓ **2014: 6th annual report of the ESTS Thoracic DB**
- ✓ Collection of data: July 2007 – February 2014
- ✓ At the time of analysis:
  - 235 units throughout Europe
  - 66,623 patients providing information
  - 51,112 lung resections (80% of procedures)
  - > 105 units with more than 100 cases

Epidemiologic Tool

The Silver Book

Annual Report: www.ests.org

THE ESTS DATABASE



ESTS Registry
The ESTS Thymic Prospective Database

ESTS prospective thymic database
Preliminary results

Thymic Tumors
prospective cases
January 2007- April 2015 - N=569

Available in the ESTS 2015 edition of the silver book

ESTS prospective thymic database
Preliminary results

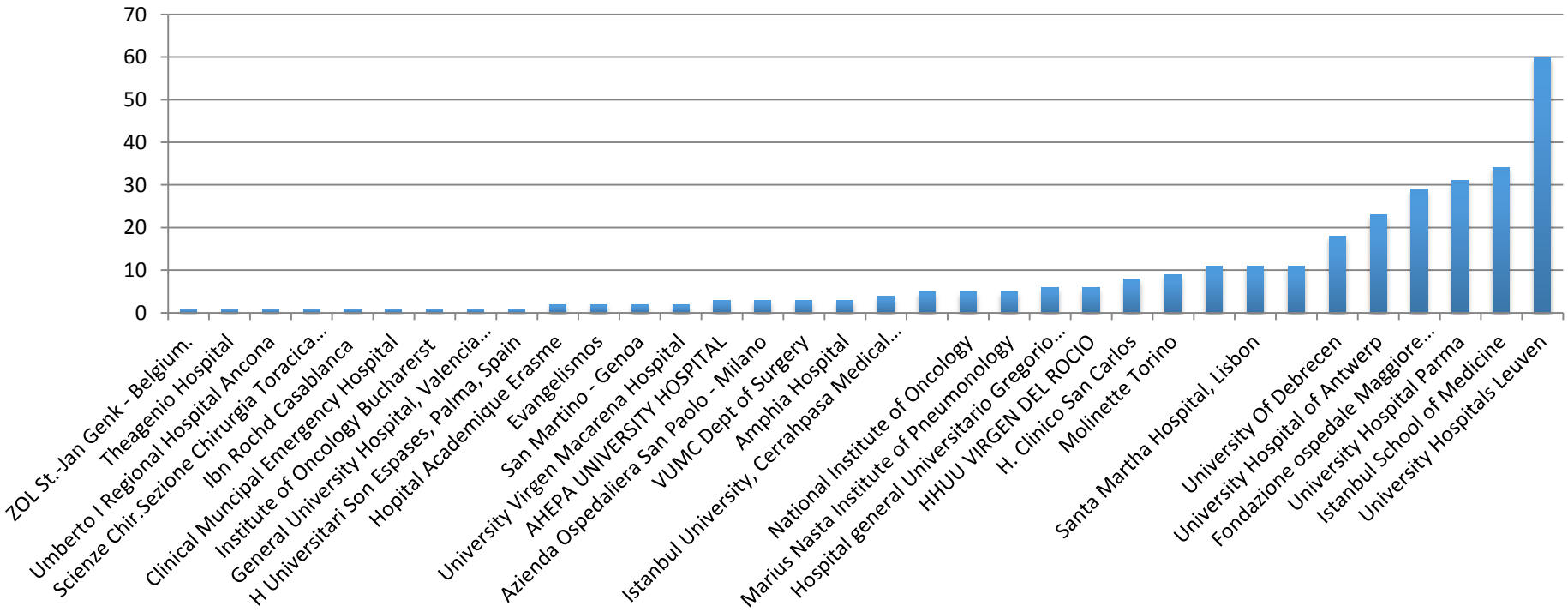
Participating centers

N=34
569 cases

ZOL St.-Jan Genk - Belgium.	1	0,3
Theagenio Hospital	1	0,3
Umberto I Regional Hospital Ancona	1	0,3
Scienze Chir.Sezione Chirurgia Toracica - Osped.Riun.univ.Di Foggia	1	0,3
Ibn Rochd Casablanca	1	0,3
Clinical Muncipal Emergency Hospital	1	0,3
Institute of Oncology Bucharerst	1	0,3
General University Hospital, Valencia (Spain)	1	0,3
H Universitari Son Espases, Palma, Spain	1	0,3
Hopital Academique Erasme	2	0,7
Evangelismos	2	0,7
San Martino - Genoa	2	0,7
University Virgen Macarena Hospital	2	0,7
AHEPA UNIVERSITY HOSPITAL	3	1,0
Azienda Ospedaliera San Paolo - Milano	3	1,0
VUMC Dept of Surgery	3	1,0
Amphia Hospital	3	1,0
Istanbul University, Cerrahpasa Medical Faculty	4	1,3
University Hospital of Lung Disease ,Thorax Surgery Service,"Shefqet Ndroqi"	5	1,6
National Institute of Oncology	5	1,6
Marius Nasta Institute of Pneumonology	5	1,6
Hospital general Universitario Gregorio Maranon	6	2,0
HHUU VIRGEN DEL ROCIO	6	2,0
H. Clinico San Carlos	8	2,6
Molinette Torino	9	3,0
University of Szeged, Department of Surgery	11	3,6
Santa Martha Hospital, Lisbon	11	3,6
Hospital Clinic; Barcelona University, Department of Thoracic Surgery	11	3,6
University Of Debrecen	18	5,9
University Hospital of Antwerp	23	7,5
Fondazione ospedale Maggiore Policlinico	29	9,5
University Hospital Parma	31	10,2
Istanbul School of Medicine	34	11,1
University Hospitals Leuven	60	19,7

ESTS prospective thymic database
Preliminary results

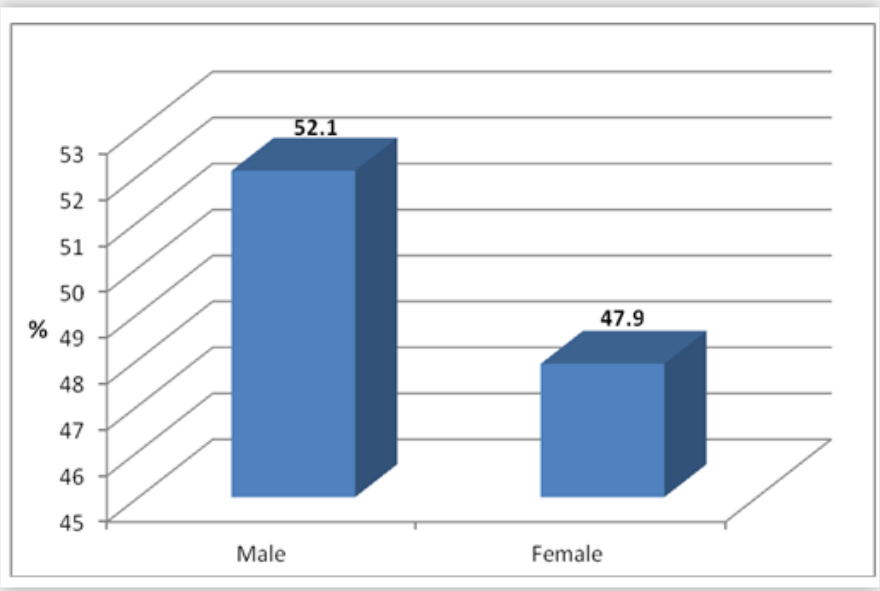
Accrual by center

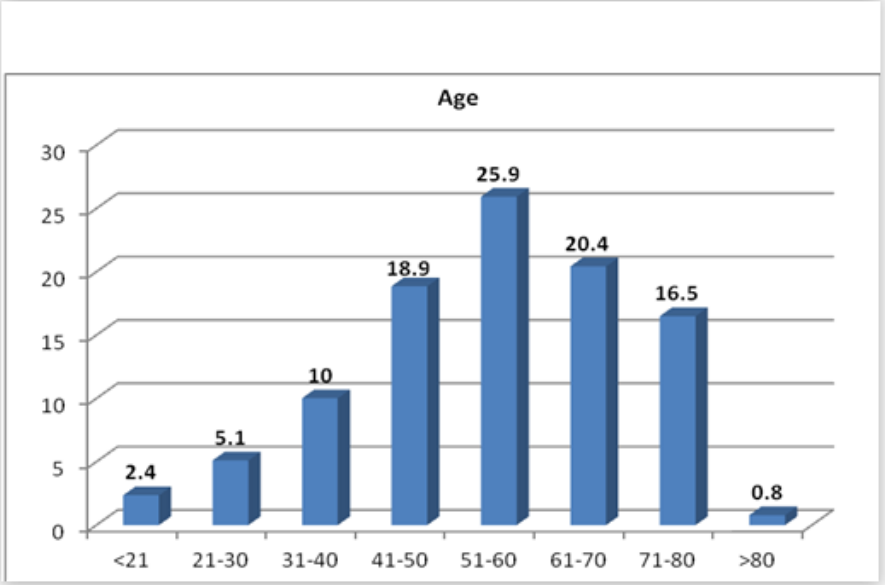


ESTS prospective thymic database
Preliminary results

Demographics

sex		N	Percent
0	Male	289	50,8
1	Female	280	49,2
	Total	569	100,0

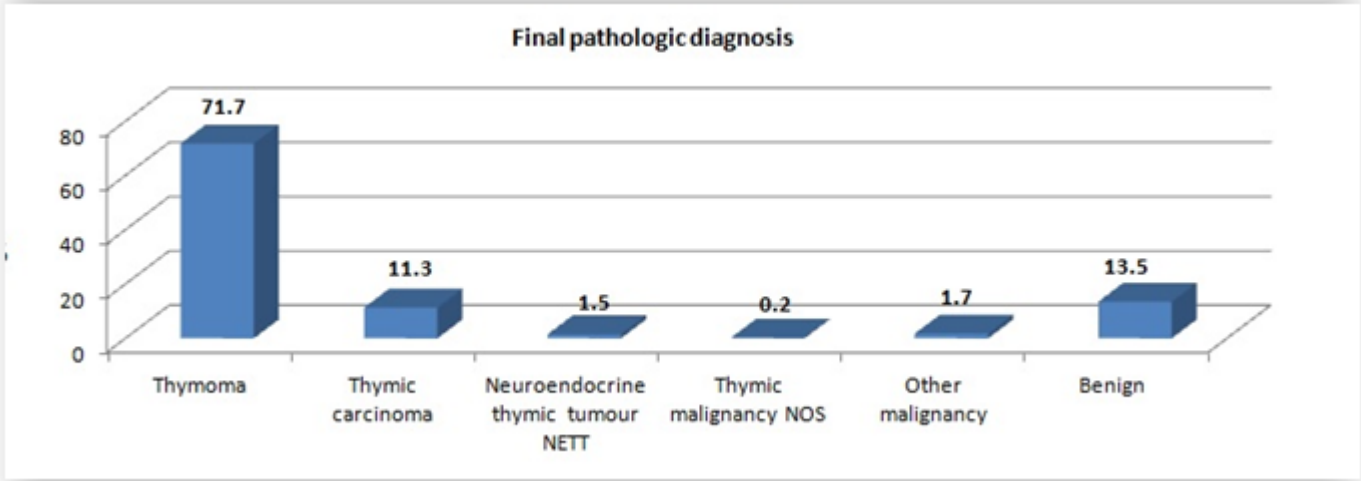




ESTS prospective thymic database
Preliminary results

Type of thymic tumors

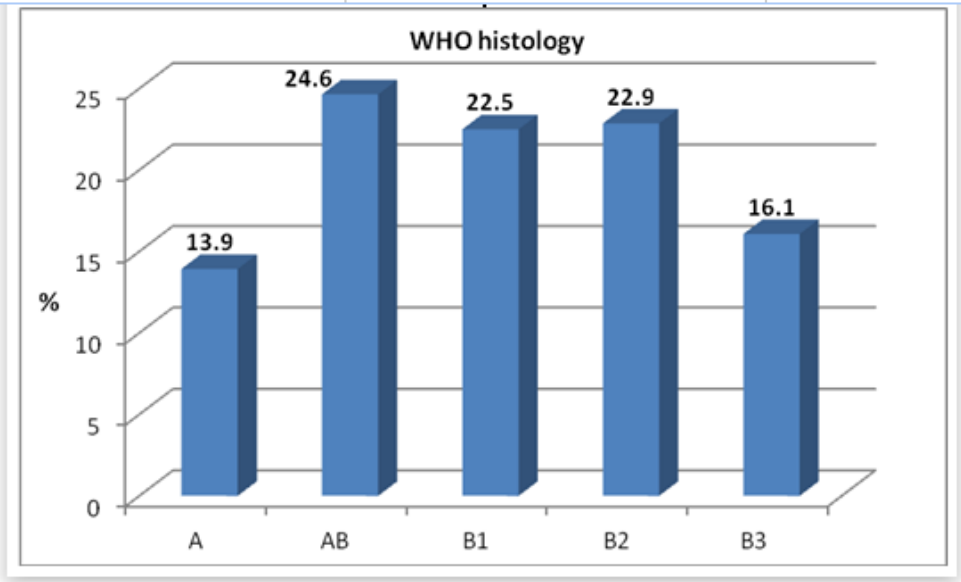
finalpathologicdiagnosis		N
	Missing data	149
1	Thymoma	277
2	Thymic carcinoma	69
3	Neuroendocrine thymic tumour NETT	6
4	Thymic malignancy NOS	2
5	Other malignancy	9
6	Benign	57
	Total net missing	420
	Total	569



ESTS prospective thymic database
Preliminary results

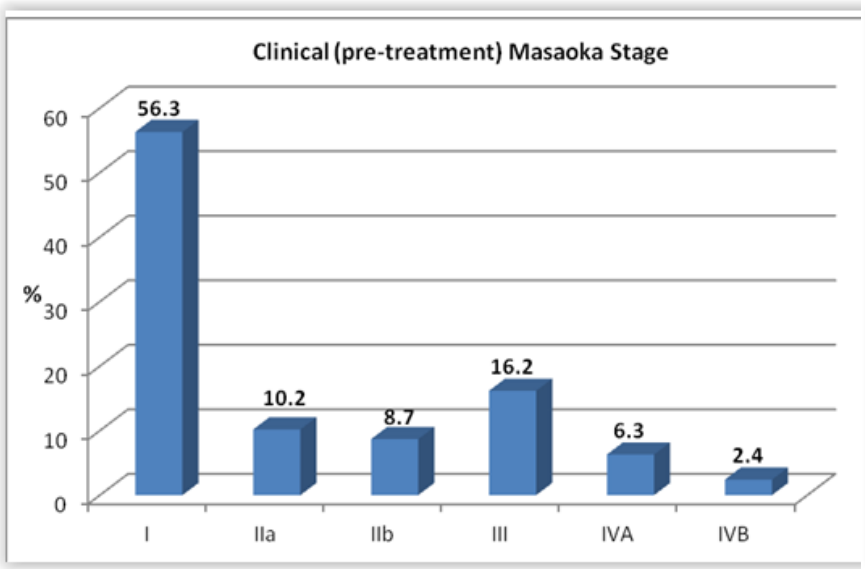
Thymoma histology (WHO)

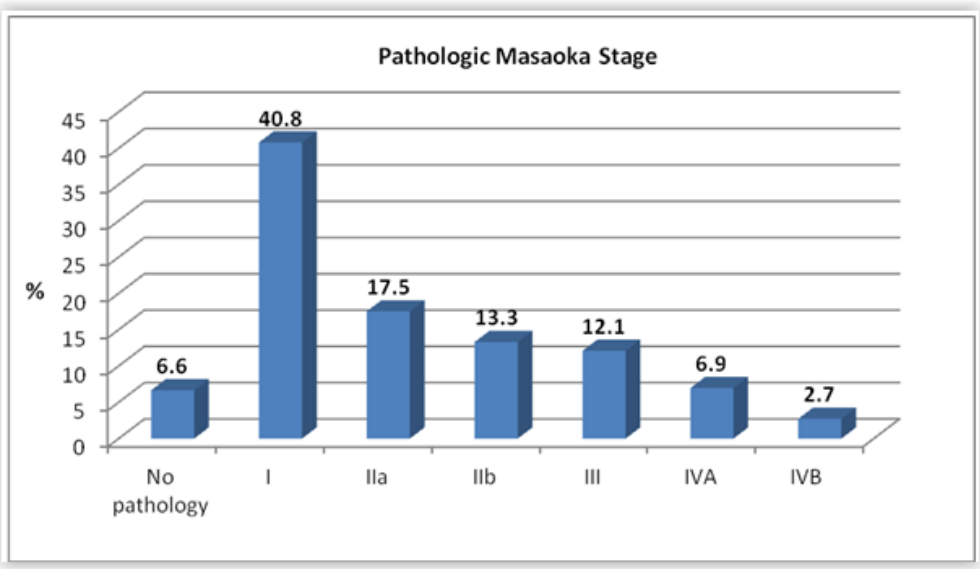
whothymomahistology		N	Percent
	Missing data	281	
1	A	36	12,5
2	AB	67	23,3
3	B1	67	23,3
4	B2	67	23,3
5	B3	51	17,7
	Total net missing	288	100,0
	Total	569	



ESTS prospective thymic database
Preliminary results

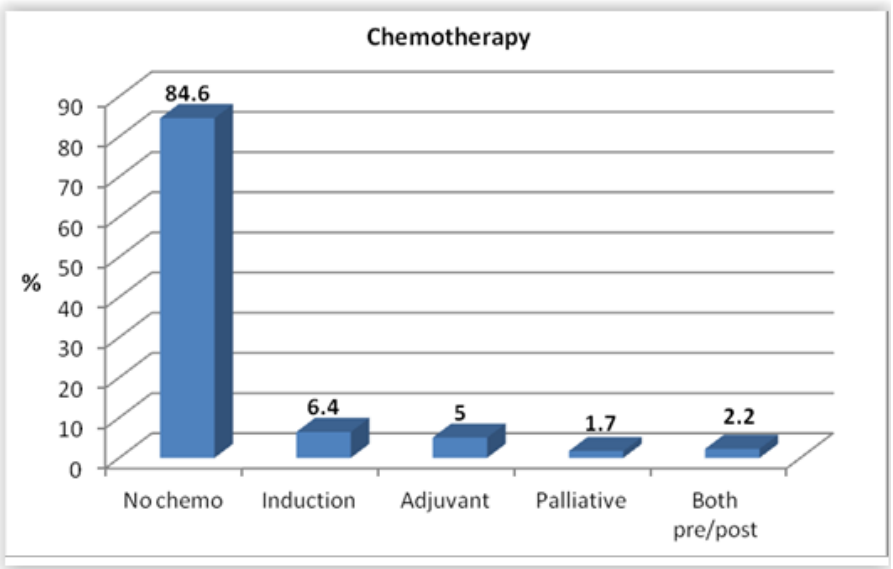
Clinical and pathologic Masaoka-Koga Stage

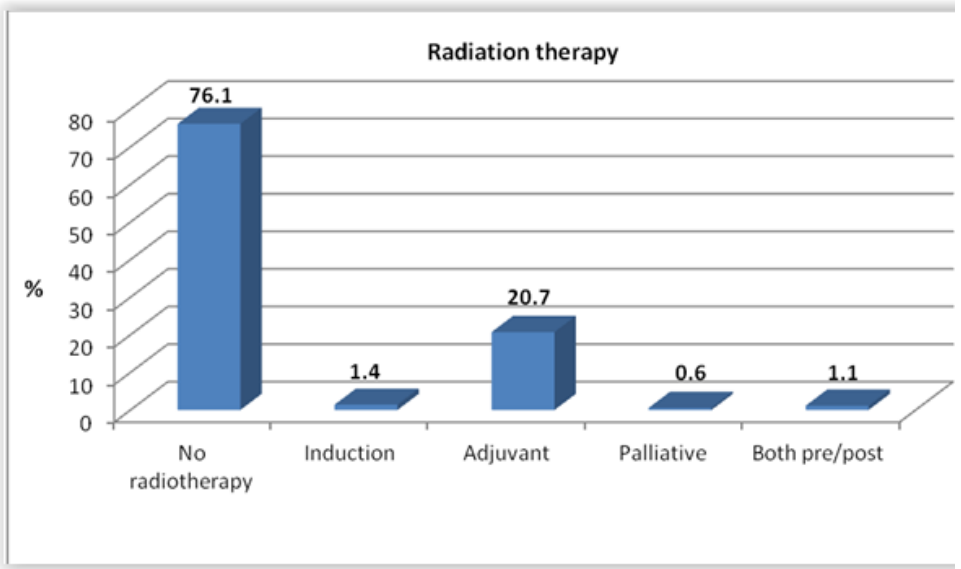




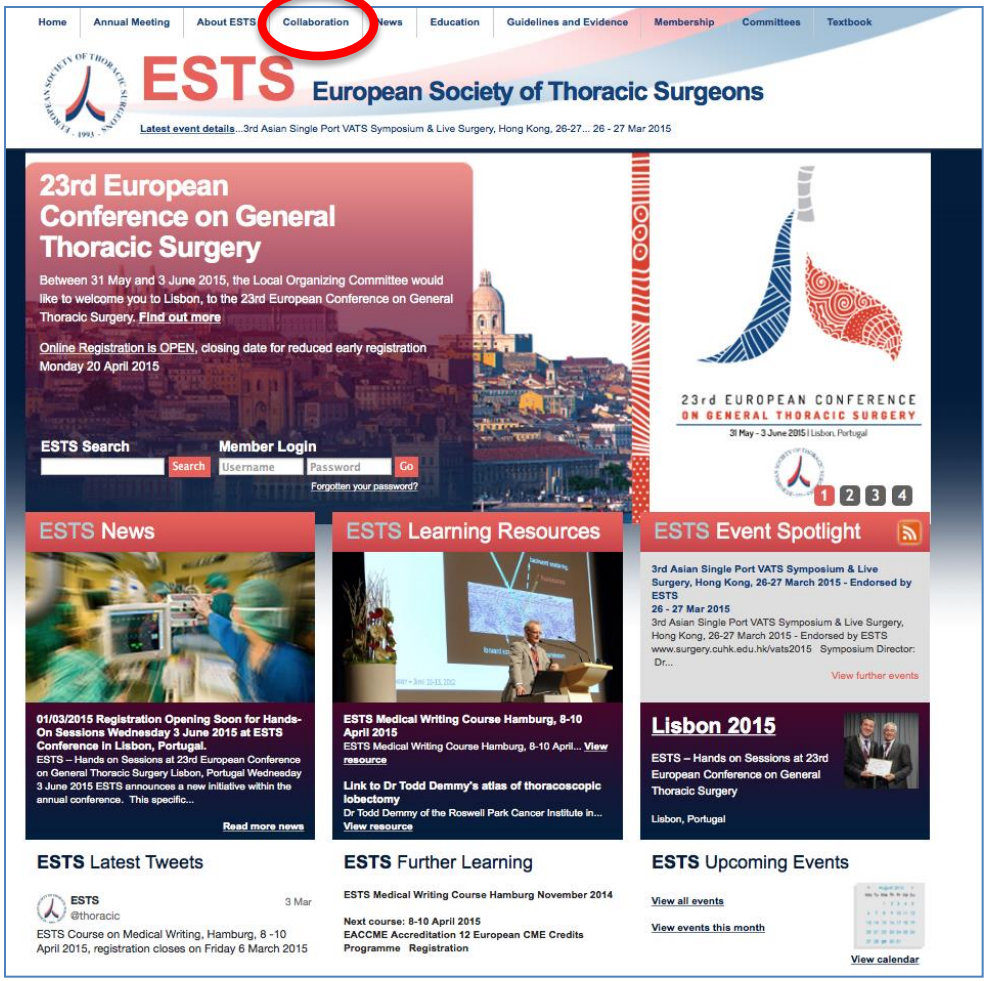
ESTS prospective thymic database
Preliminary results

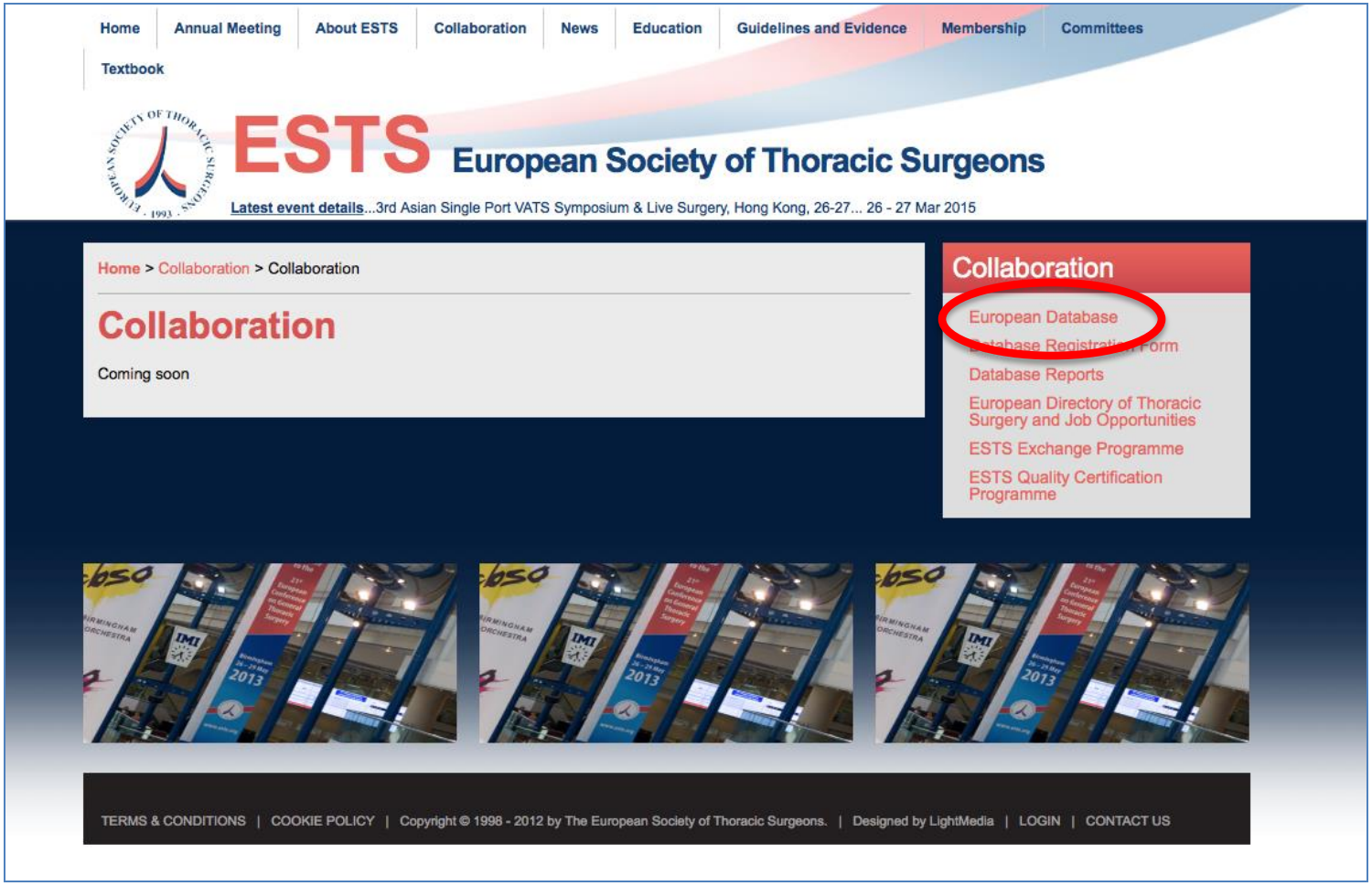
Perioperative treatments - chemotherapy and radiotherapy





ESTS Homepage

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Home > Collaboration > Database Registration Form
Database Registration Form and User Instructions
ESTS Registration Form
User Instructions for ESTS Registry
Please complete the registration form and email it to:
Dr Stefano Passani s.passani@dendrite.it or
Dr Danilo Pellicano d.pellicano@dendrite.it
To the ESTS database members :
Your own data, collected in a standardized ESTS-endorsed Dataset, can be downloaded at local level (excel file) and used for your internal quality analyses or institutional research purposes.
Participants (including more than 100 patients a year) can propose their own research projects based on the total data present in the database. Projects should be submitted to the ESTS Database Committee for peer review and, if accepted, the requested and anonymized data will be provided to the proponent of the project. ESTS will retain the responsibility for the final analysis and interpretation of results. The proponent of the project will be the first Author of the final manuscript and he/she will be allowed to include, if requested, additional two colleagues, who helped in the elaboration of the manuscript. The members of the Database Committee who contributed to the review process and assisted in the development of the manuscript will be also included in the list of Authors.
As a future project, participants will receive a periodic confidential feedback on the quality of their data and their performance against international benchmarks.
Collaboration
European Database
Database Registration Form
European Directory of Thoracic Surgery and Job Opportunities
ESTS Exchange Programme
ESTS Quality Certification Programme

Registration Form for ESTS Registry

User Details

Username:	
Password:	
Name & Surname:	
Hospital:	
Telephone:	
Email:	

Dear Colleague,
Please fill in all the required information electronically, and save it as a .doc document, then e-mail it to:

Dr Stefano Passani s.passani@dendrite.it +39-334-5712451 *or*

Ing Danilo Pellicano d.pellicano@dendrite.it +39-334-5712449 *or*

Once we have completed your registration, we will e-mail you your details to access the new ESTS Database, with the Instructions to assist you in your first few logs in.
We are here to assist you for any issues with the new database

Thanks for your collaboration!

Stefano Passani

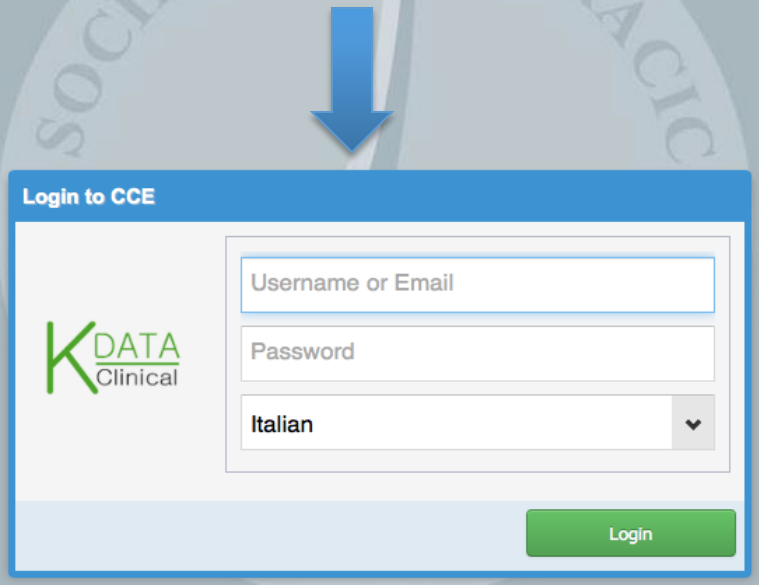
DENDRITE
Clinical System Italia srl
Via Orazio, 31 - ROMA I-00193
843041008 REA: 1121457
322 Fax: +39-06-86386323

ESTS membership required (and checked) before acceptance

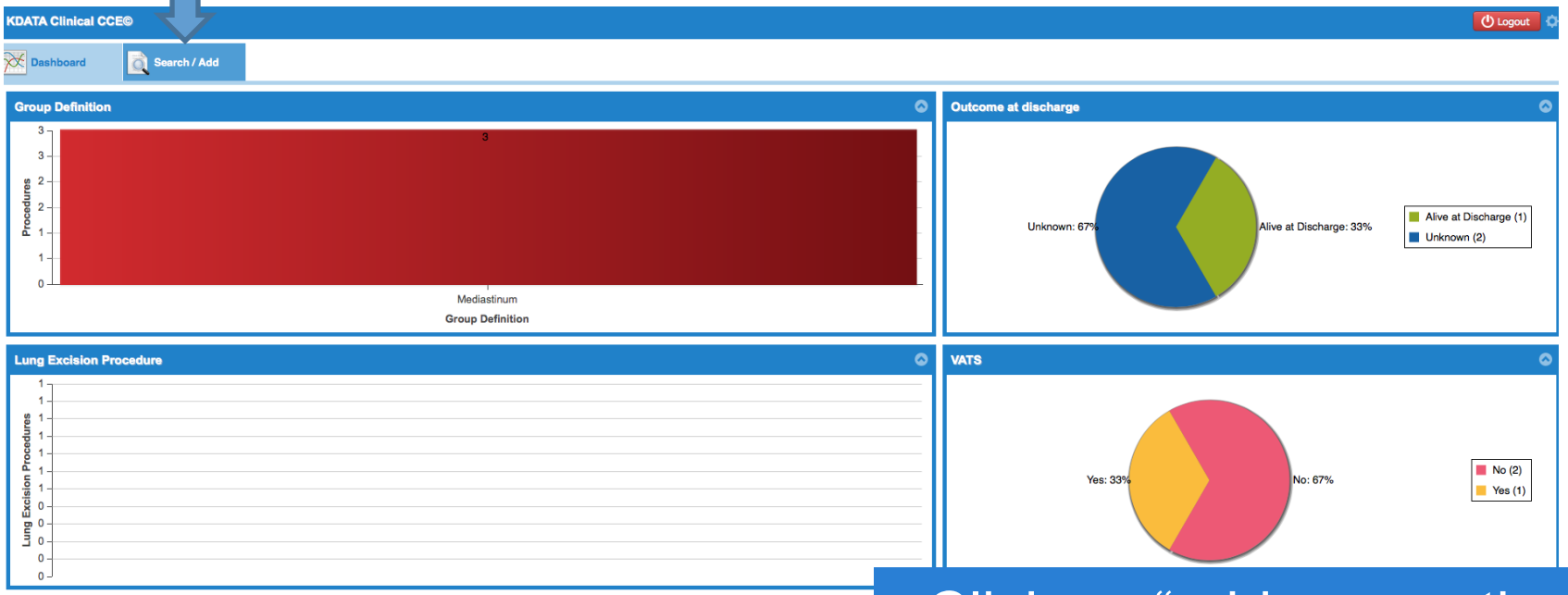
" The database project has been financially supported by Medela Healthcare "

EUROPEAN SOCIETY OF THORACIC SURGEONS
ESTS
REGISTRY

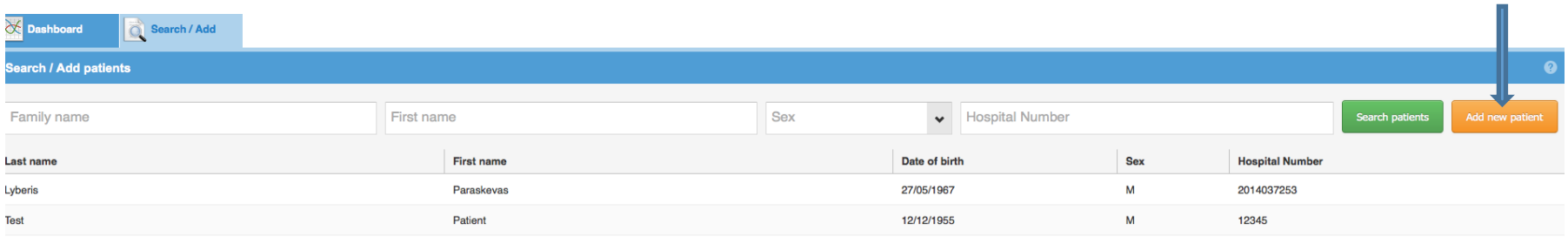
Log in with the credentials provided by Dendrite



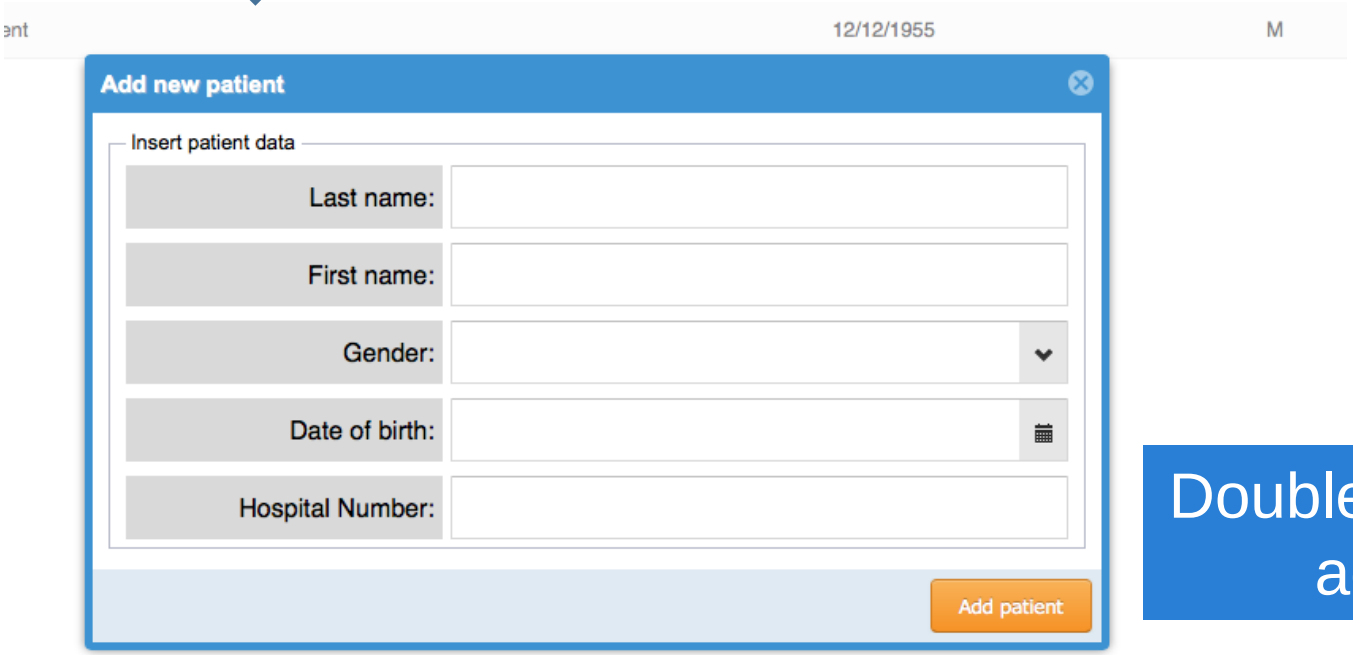
Click on search/add



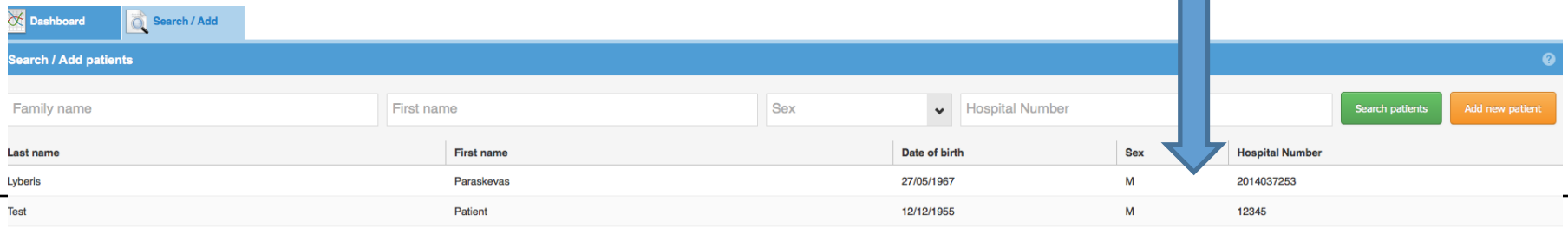
Click on “add new patient”



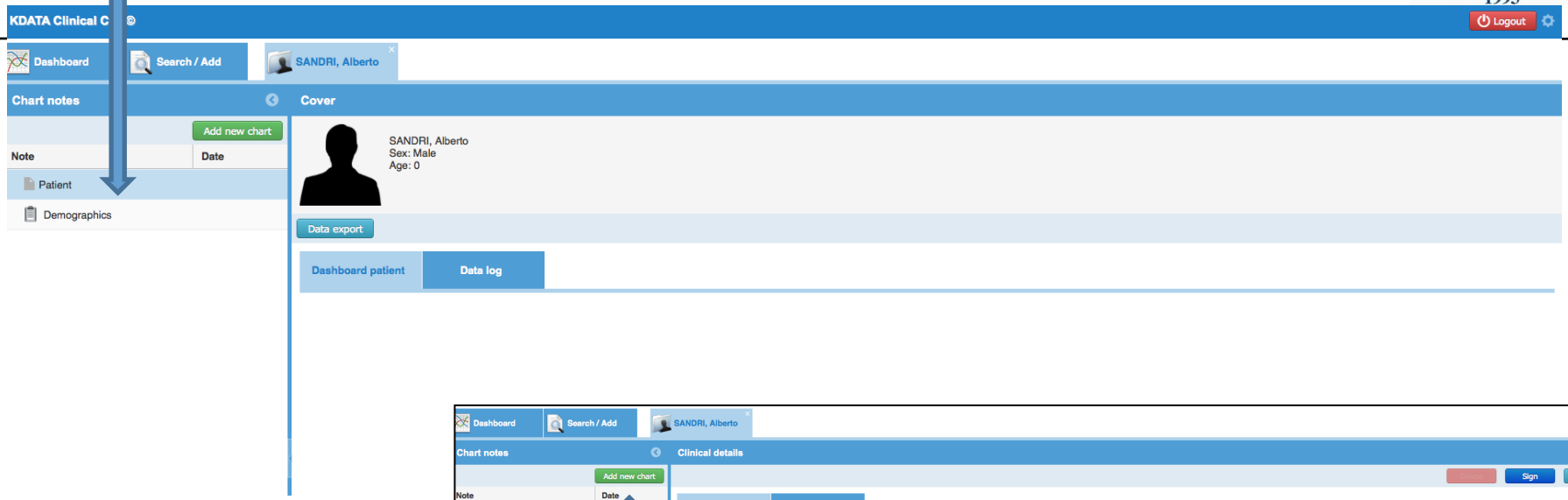
Complete the required fields
Then click on “add patient”

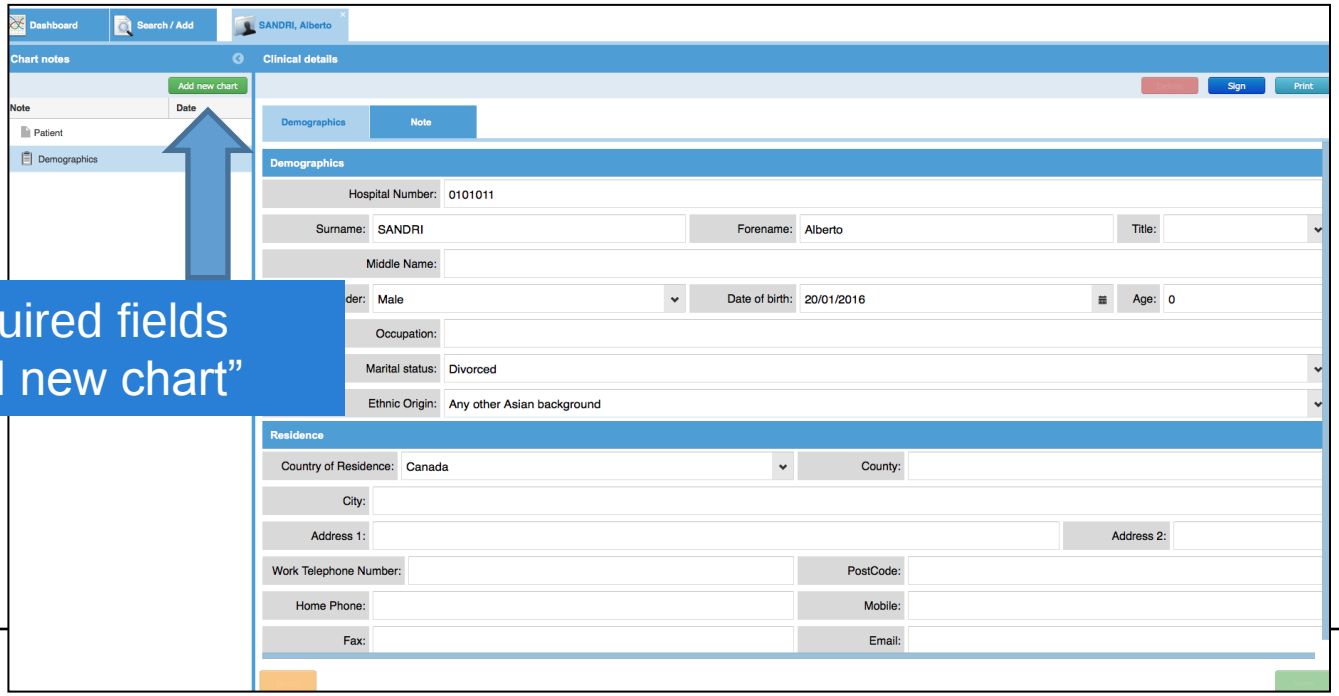


Double-click on the new added patient



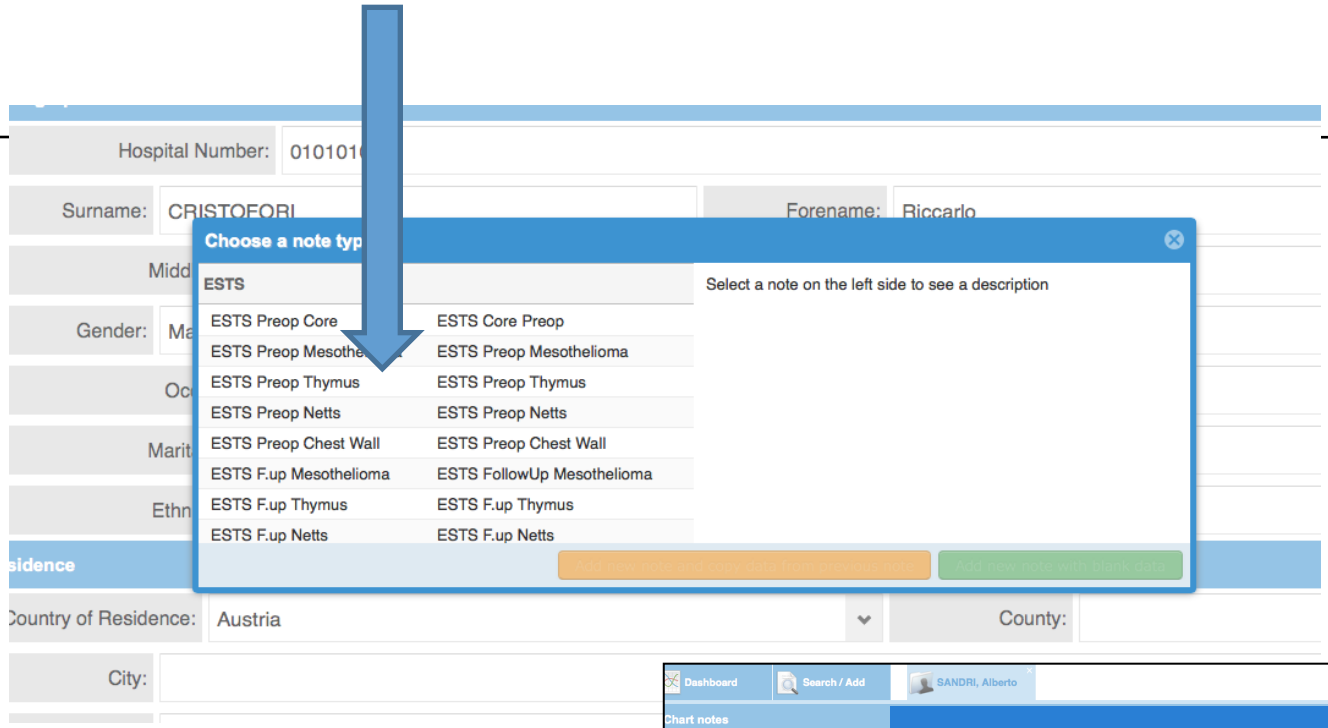
Click on “Demographics”



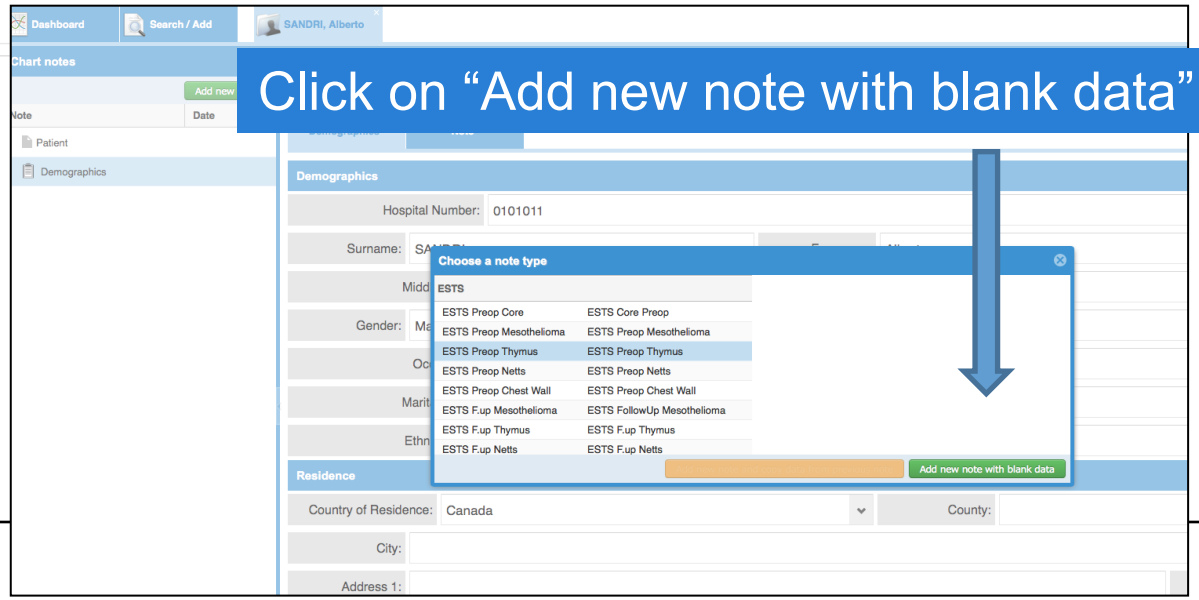


Complete the required fields
Then click on “add new chart”

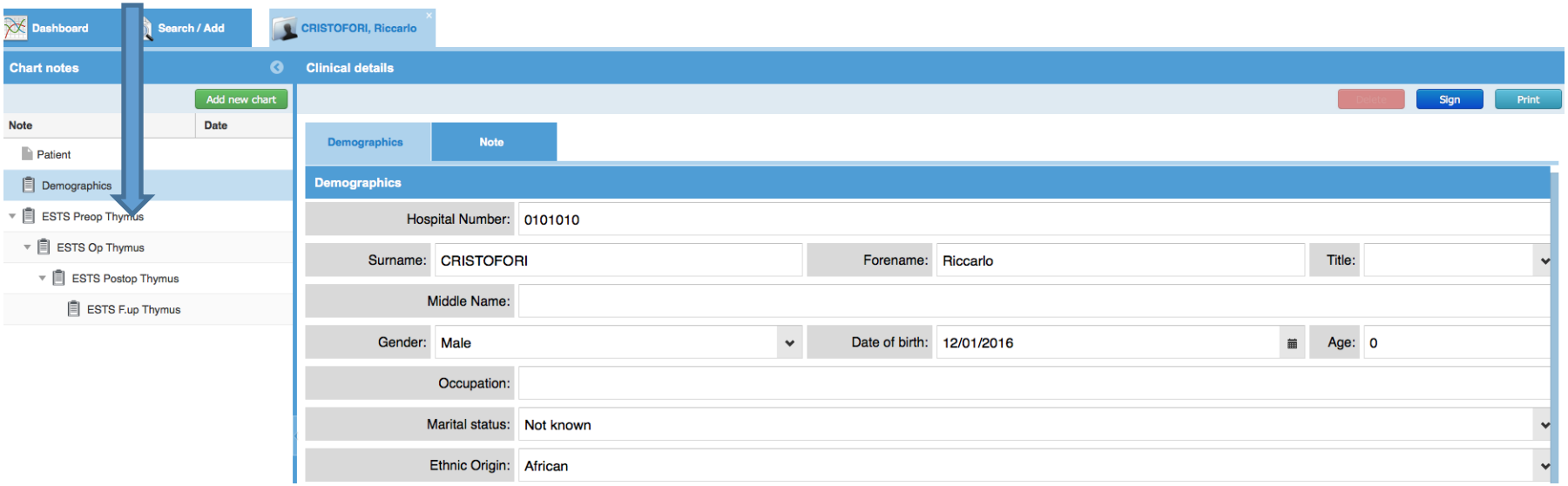
Choose “ESTS preop thymus”



Click on “Add new note with blank data”

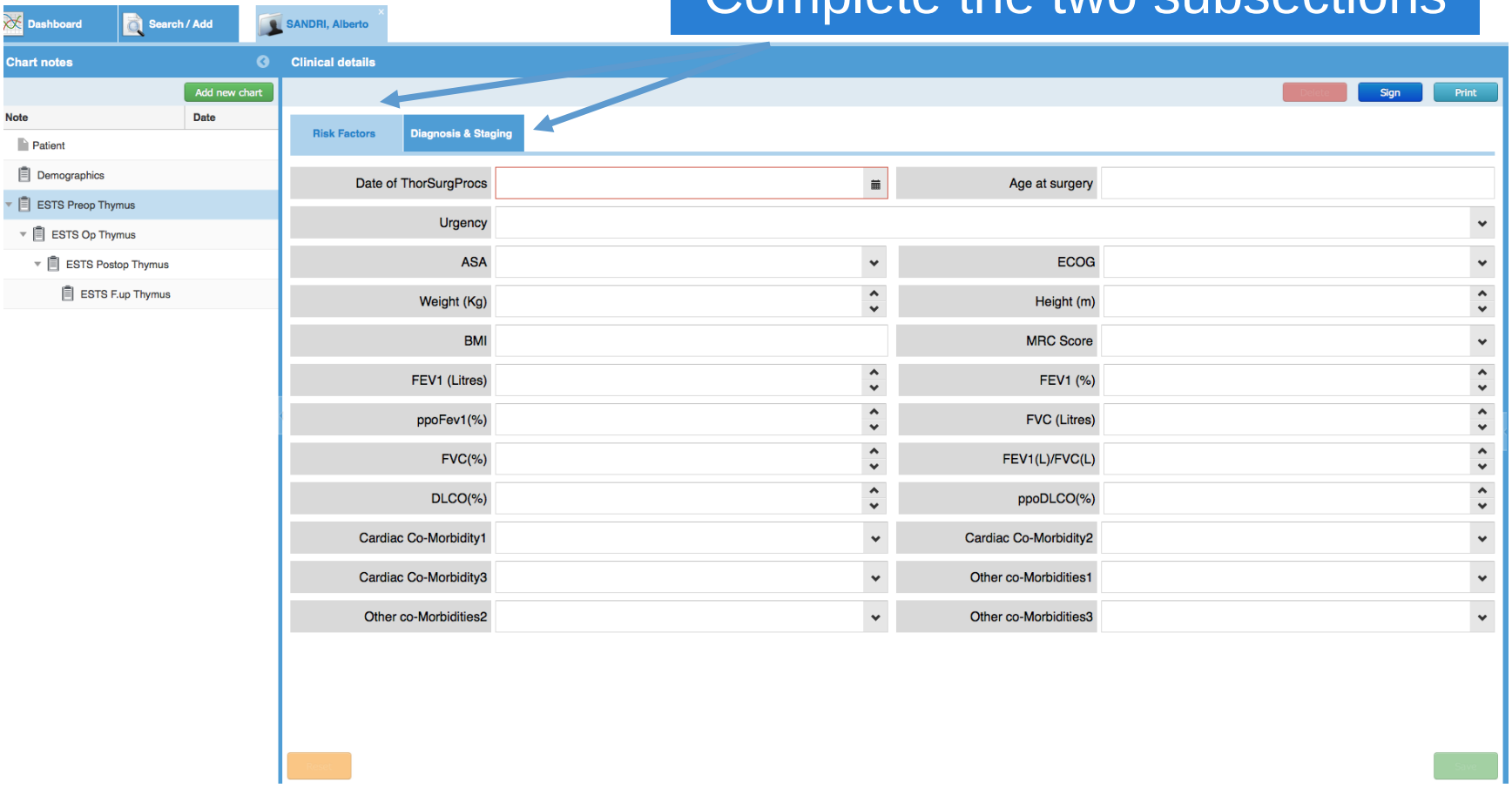


A drop-down menu appears with all the thymus sections

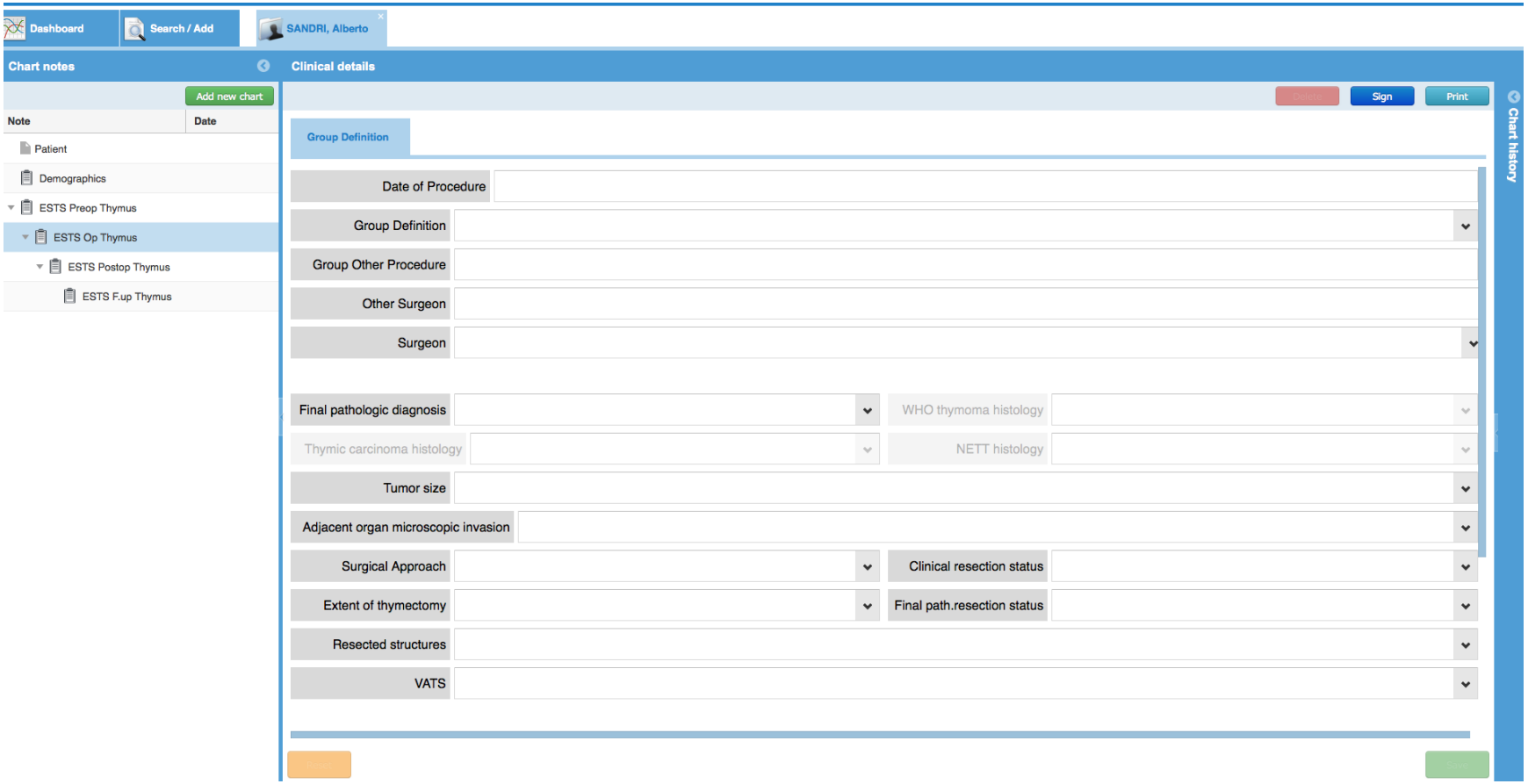


Preoperative section

Complete the two subsections

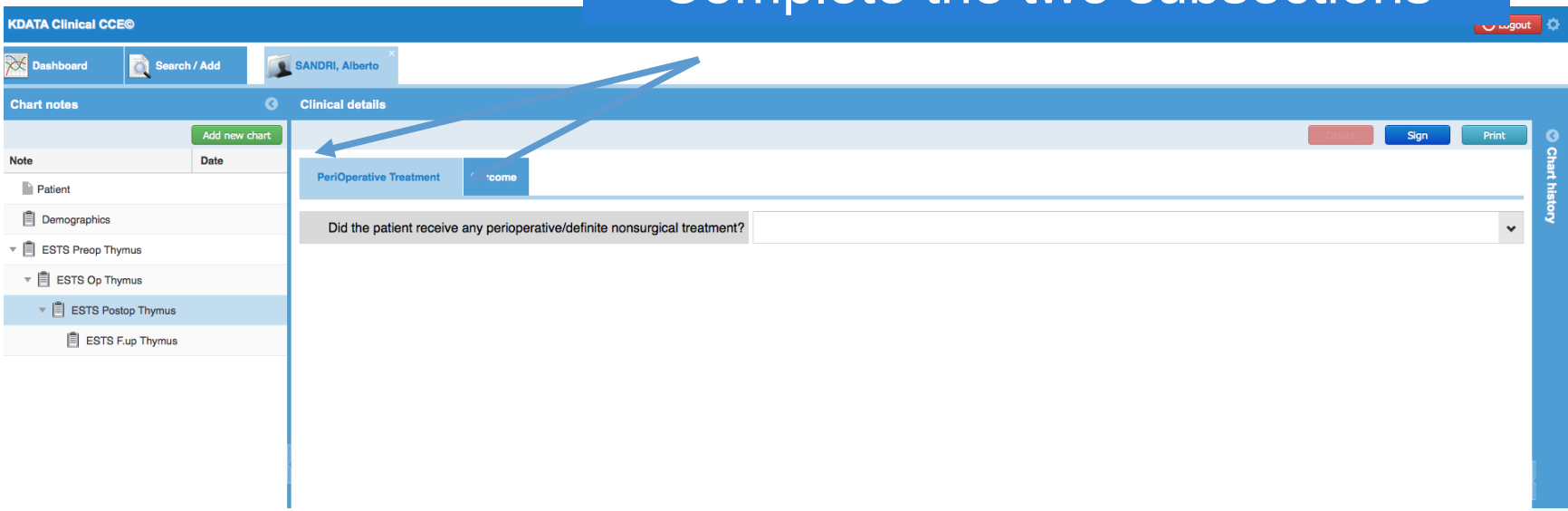


Intra-operative section

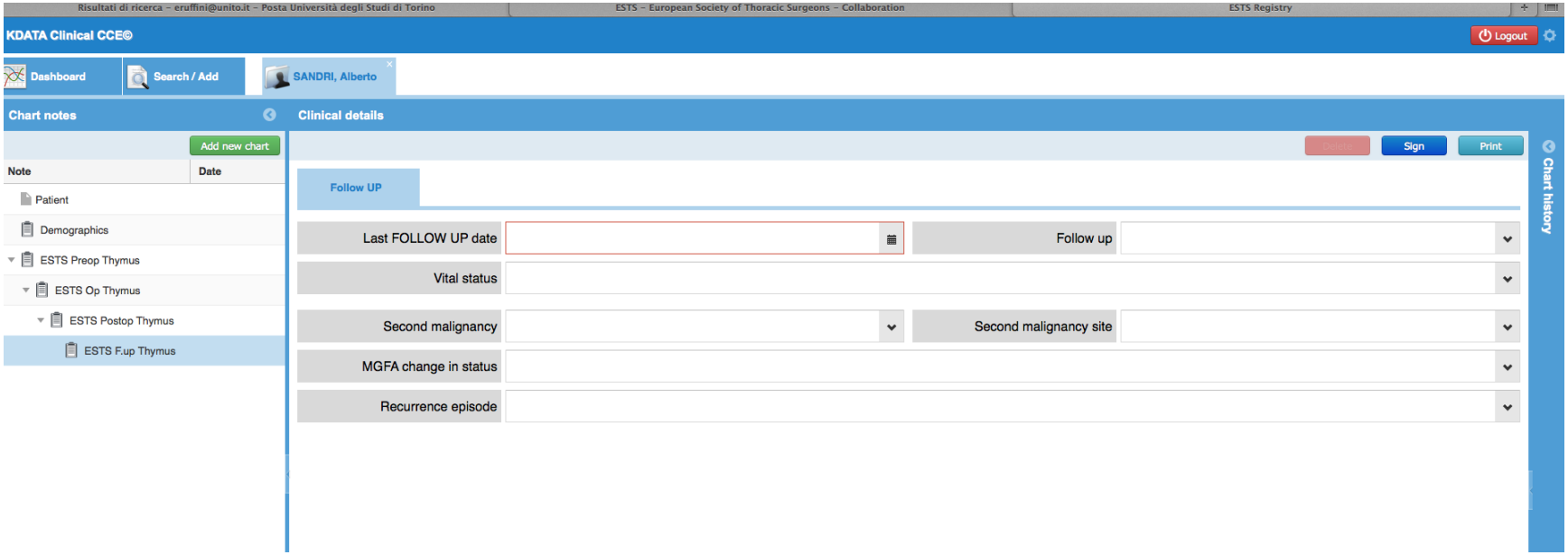


Postoperative section

Complete the two subsections



Follow-up section



Instructions for data input

Dendrite Software Reference

Intellect Web

Data Entry

(Authors: Danilo Pellicano,Stefano Passani Version 1.0 May 2010)

EUROPEAN SOCIETY OF THORACIC SURGEONS
ESTS
Registry

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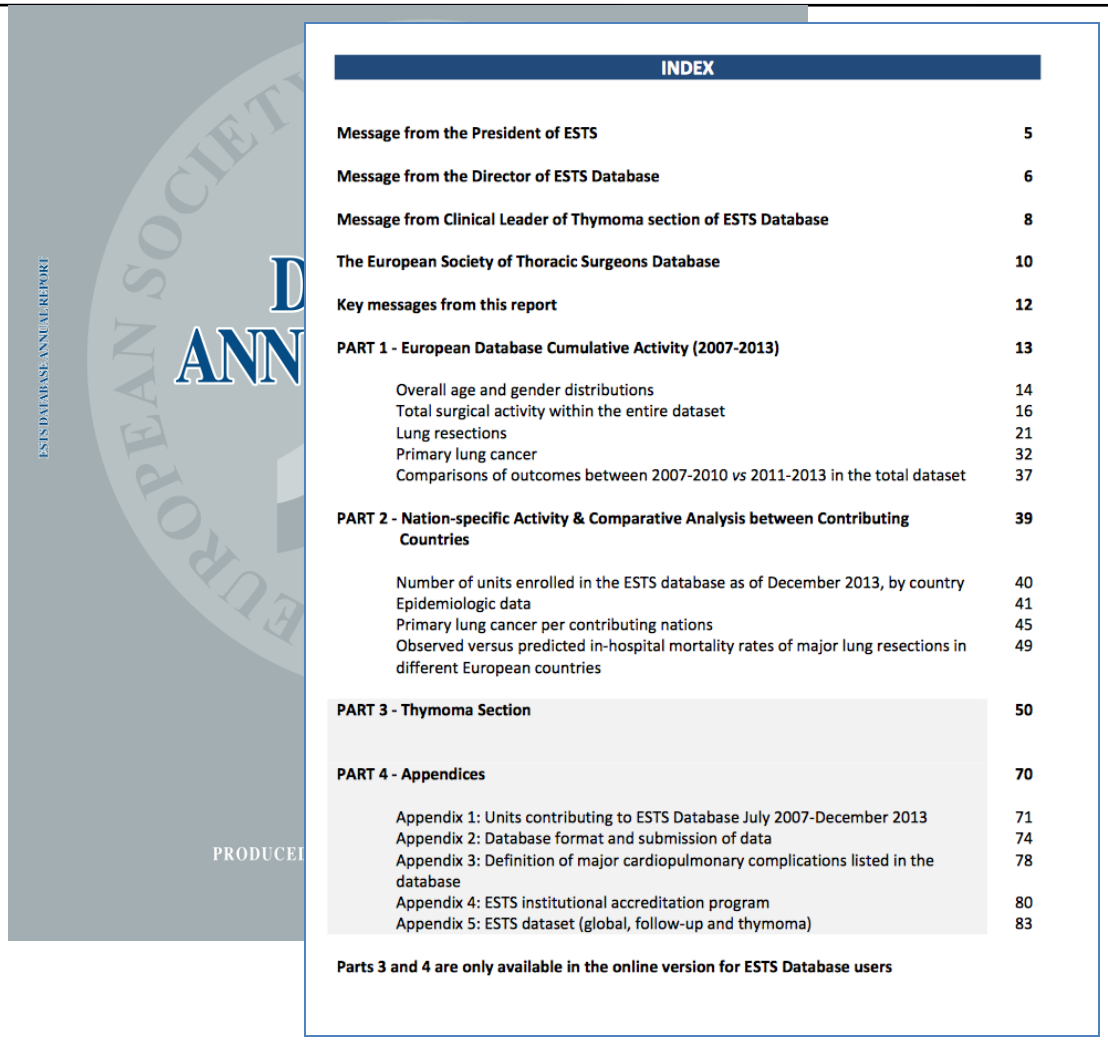
Tel: +39-06 86386322
Fax: +39-06 86386323
E-mail: info@dendrite.it

ESTS Registry Annual Report (Silver Book)

ESTS Registry Annual Report (Silver Book)



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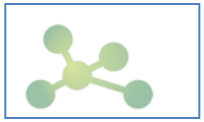
Parts 3 and 4 are only available in the online version for ESTS Database users

Instructions for data input

For any support or information request, please refer to:

Dr Stefano Passani s.passani@dendrite.it +39-334-5712451 or

Ing Danilo Pellicano d.pellicano@dendrite.it +39-334-5712449 or



Dendrite

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Tel: +39-06-86386322 Fax: +39-06-86386323

Presentation overview

- The TNM-based staging system for thymic tumors
- Update in surgery for early stage and locally advanced thymic tumors
- Update in advanced disease and thymic tumors guidelines
- Update on the ESTS thymic group
- Conclusions

Conclusions – What's new in thymic tumors

- A new TNM-based staging system will soon be effective (1/17) replacing the Masaoka-Koga staging system
- Surgery maintains a primary role in all thymic malignancies (Thy, TC, NETT)
- Early stages thymomas (Stage I-II , < 5 cm.) are optimally approached by MIT (VATS or RATS)
- Invasive tumors require a multimodality approach. Complete resection with extended resection to the neighboring organs should be attempted with excellent long-term survivals.
- Promising surgical techniques (EPP, HIOC) are available for advanced disease.
- An updated guidelines from ESMO is available for proper management
- Participation to prospective international databases (ESTS thymic registry) is strongly encouraged to offer optimal cures to our patients