

Thoracic malignant solitary fibrous tumors: Prognostic factors and long-term survival

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Thoracic solitary fibrous tumors (TSFTs) are uncommon neoplasms, with an estimated age-standardized incidence rate of 1.4 per million population (95% CI, 0.54-2.2) (1).

In the 1980s, two landmark studies were published on TSFTs. Briselli et al. (2) analyzed 360 cases of solitary fibrous tumor of the pleura from the literature and described eight new cases, emphasizing that no single pathologic feature allowed a definite statement about the clinical behaviour of TSFTs. The tumor was responsible for the patient's death in 38 (12%) out of 327 cases with available follow-up information after surgical resection. England et al. (3) reviewed 223 cases of localized fibrous tumor of the pleura identified in the files of the Armed Forces Institute of Pathology. Tumors were considered to be malignant if one or more of the following histologic features were present: high cellularity and mitotic activity, pleomorphism, hemorrhage, and necrosis. Follow-up (median, 31 months) was obtained in 71 patients with histologically malignant tumor: 68 (96%) of the patients underwent surgical resection and 36 (53%) of those undergoing surgery had a dismal outcome. The authors stated that the single best predictor of clinical benignity was whether the tumor could be totally resected.

Recent literature dealing with TSFTs consists mainly of single case reports and retrospective single institution series, in which data were collected over extended periods of time in order to have a reasonable number of patients (4-8). In these series, the incidence rate of histologically malignant TSFTs ranges from 13% to 37% and predictors of outcome include a number of patient-related (presence of symptoms), disease-related (recurrence on presentation, gross morphologic features and size of the tumor, presence of a pathologically malignant component) and treatment-related (macro or microscopically positive surgical margins) factors, which are not clinically or biologically independent. Long-term survival following surgical resection of malignant TSFTs is variously reported as median survival [ranging from 24 to 55 months (6,8)], actuarial 5-year survival rate [ranging from 45.5% to 89% (8,5)], and overall disease-free survival rate (67%) (7). Notably, in all of the series, the denominator for the study, that is the number of potential patients who were evaluated in the study period, is missing.

In this issue of the Journal of Thoracic Disease, Milano et al. (9) report on a study they performed to evaluate overall survival (OS) and cancer specific survival (CSS) in a series of 82 patients registered in the Surveillance, Epidemiology, and End Results (SEER) database with a diagnosis of malignant TSFTs from 2001 to 2007. This study benefits optimally from the inclusion of a distinctly large number of patients over a recent time frame and highlights several important

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findings.

Out of 77 patients with available staging information, 58 (75%) had intrathoracic disease only and nearly half (26/58) of these patients showed regional disease extension or nodal metastases. The 19 (25%) remaining patients showed extrathoracic metastases at presentation.

Seventy out of 82 (85%) patients underwent cancer-directed surgery. However, taking into account the SEER definitions of radical surgical resection, radical-extent surgery was performed in 33/70 (47%) patients and less-than-radical extent surgery was performed in 32/70 (46%) patients. The extent of surgery was unknown in 5/70 (7%) patients.

Median follow-up in all patients was 2.2 years. Median and 5-year OS were 4.6 years and 49%, respectively. Median and 5-year CSS were 5.7 years and 61%, respectively. Significantly or borderline significantly ($P < 0.10$) adverse prognostic factors from univariate analysis included older age (for OS but not CSS), higher stage, and no cancer-directed surgery. Interestingly, undergoing less than radical surgery was not a significantly adverse prognostic factor for OS ($P = 0.19$) and marginally impacted CSS ($P = 0.063$). At multivariate analysis, disease stage and undergoing cancer-directed surgery emerged as independent predictors of survival. However, even if only three patients treated without cancer-directed surgery were at risk beyond 1 year, the actuarial OS and CSS of patients undergoing cancer-directed surgery was similar to those not undergoing surgery at long-term follow-up (>5 years).

Milano et al do not come to firm conclusions in their retrospective study, which is appropriate. Actuarial survival curves provide an estimate of survival which depends on sample size, duration of follow-up, and median survival, and caution is to be used when interpreting the results of multivariate analysis in limited numbers of patients with a rare disease in order to avoid potentially misleading conclusions. Furthermore, the survival outcome of patients not undergoing cancer-directed surgery might be influenced more by prognostic factors that contraindicated surgery than by the absence of surgical treatment. Finally, the authors state that the histologic diagnosis of malignant TSFTs suffers from complexities and uncertainties. However, the series includes patients with malignant TSFTs diagnosed from 2001 to 2007, so that it is likely that in most, if not all of the cases, modern immunochemistry techniques

were used for differentiating malignant TSFTs from other malignancies and benign conditions.

Thoracic malignant solitary fibrous tumors continue to be enigmatic neoplasms (10) and to represent a therapeutic challenge for the thoracic surgeons. Further investigation, hopefully in the form of a multicenter study stratified by patient, disease, and treatment-related factors, is needed to definitely clarify the clinical behaviour and to determine the optimal treatment of these rare tumors.

References

1. Thorgeirsson T, Isaksson HJ, Hardardottir H, Alfredsson H, Gudbjartsson T. Solitary fibrous tumors of the pleura. An estimation of population incidence. *Chest* 2010;137:1005-6.
2. Briselli M, Mark EJ, Dickersin GR. Solitary fibrous tumors of the pleura: eight new cases and review of 360 cases in the literature. *Cancer* 1981;47:2678-89.
3. England DM, Hochholzer L, McCarthy MJ. Localized benign and malignant fibrous tumors of the pleura. A clinicopathologic review of 223 cases. *Am J Surg Pathol* 1989;13:640-58.
4. Gold JS, Antonescu CR, Hajdu C, Ferrone CR, Hussain M, Lewis JJ, et al. Clinicopathologic correlates of solitary fibrous tumors. *Cancer* 2002;94:1057-68.
5. Magdeleinat P, Alifano M, Petino A, Le Rochais J-P, Dulmet E, Galateau F, et al. Solitary fibrous tumors of the pleura: clinical characteristics, surgical treatment and outcome. *Eur J Cardiothor Surg* 2002;21:1087-93.
6. Sung SH, Chang J-W, Kim J, Lee KS, Han J, Park SI. Solitary fibrous tumors of the pleura: surgical outcome and clinical course. *Ann Thorac Surg* 2005;79:303-7.
7. Cardillo G, Carbone L, Carleo F, Masala N, Graziano P, Bray A, et al. Solitary fibrous tumors of the pleura: an analysis of 110 patients treated in a single institution. *Ann Thorac Surg* 2009;88:1632-7.
8. Harrison-Phipps KM, Nichols FC, Schleck CD, Deschamps C, Cassivi SD, Schipper PH, et al. Solitary fibrous tumors of the pleura: results of surgical treatment and long-term prognosis. *J Thorac Cardiovasc Surg* 2009;138:19-25.
9. Milano MT, Singh DP, Zhang H. Thoracic malignant solitary fibrous tumors: a population-based study of survival. *J Thorac Dis* 2011;3:99-104.
10. de Perrot M, Fischer S, Bründler M-A, Sekine Y, Keshavjee S. Solitary fibrous tumors of the pleura. *Ann Thorac Surg* 2002;74:285-93.

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