

*Letter to
the Editor*

Chest Wall Reconstruction: Impact of Gore-Tex® Dual-Mesh Prosthesis on Respiratory Function

[Letter regarding “Chest Wall Reconstruction using Gore-Tex® Dual Mesh.” (Ann Thorac Cardiovasc Surg 2011; 18: 166-9)]

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To the Editor:

We read with great interest the report by Akiba et al.¹⁾ reporting on a series of chest wall reconstruction using polytetrafluoroethylene (PTFE) prosthesis Gore-Tex® dual-mesh. Nowadays, chest wall reconstruction has become a standard procedure for thoracic surgeons and the availability of synthetic meshes with good biocompatibility enables to cover defects after extensive resections in a one-stage procedure.²⁾ In the English literature, it is widely accepted that bony chest wall reconstruction with either polypropylene mesh or PTFE yields satisfactory results in most patients.^{3,4)} Concerning the PTFE prosthesis, Gore-Tex® dual-mesh (G-Tex), composed by two distinct surfaces (smoother surface designed for minimal tissue attachment, and patterned, indented surface designed for active tissue incorporation) has been successfully used in the repair and reconstruction of hiatus and the abdominal wall hernias; however, only few reports described a reconstruction of the bony chest wall with a G-Tex prosthesis.⁵⁾

Moreover, data available in the literature report mainly on survival, recurrence and metastasis rates whereas re-

ports focused on the impact on pulmonary function are scarce.^{6,7)} As well, no follow-up studies report about pulmonary assessment after G-Tex reconstruction.

In the period between 01/98 and 12/10, we have performed a chest wall resection in 175 patients affected by primary in 111 and secondary chest wall tumors in 64 cases. For the reconstruction of the surgical defect, prostheses were used in 39 patients: 31 treated with G-Tex and 8 with the vicryl patch.

In the G-Tex subset, there were 15 primary and 16 secondary tumors. Rib resection was performed in 27 cases, while in 11 patients, it was the sternum to be resected. A resection of quotas of pulmonary parenchyma was associated in 12 patients, always to an extent limited to the amount necessary to guarantee safe margins. Mean hospital stay was 7.9 days (range 3–21 days); the morbidity rate was 12.9% (4 patients), lower than that reported in Reference 1 (45.4%). Paradoxical respiration did not occur; perioperative mortality was nil.

After communication to the IRB, we have data mined the hospital records of those patients in the G-Tex group and reviewed their pre- and post-operative pulmonary functionality. Only a moderate negative trend has been detected: in fact, the mean FEV1, pre-operatively at 87.1 ± 5.7 %, slightly decreased to a value of 82.3 ± 8.7 % in the post-op period with no significant differences (p: 0.74).

Our results are in line with those reported elsewhere⁸⁾ confirming that the reconstruction of the chest wall after resection with the G-Tex prosthesis does not impair the lung functionality significantly.

We would really appreciate the Authors' reflections and reaction on this at the light of the respiratory functional assessment related to mesh repair in their series.

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Disclosure Statement

The authors have no conflicts of interest or financial ties to disclose.

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Reply:

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A key principle of chest reconstruction is restitution of thoracic volume sufficient for rapid resumption of normal lung expansion.³⁾ Large, full-thickness chest wall reconstruction protects the intrathoracic and upper abdominal contents, preserves the pulmonary function, supports upper extremity function, and satisfies esthetic considerations.⁴⁾ In the short-term postoperative period, chest wall reconstruction was performed to prevent complications such as paradoxical respiration, pneumonia, and atelectasis. In our report, we presented only mortality and morbidity after surgery.

Estimation of predicted postoperative forced expiratory volume in 1 second (FEV1) is frequently used to de-

fine functional operability in patients.⁵⁾ The carbon monoxide diffusing capacity of the lung, exercise testing, and the 6-minute walk test were also used in postoperative assessment.⁶⁾

The results of the pulmonary function test depend on the postoperative timing of the test, and the results of the test after more than 3 months would be expected to show better outcomes than in the early postoperative phase.⁵⁾ Furthermore, the chest wall resection may be accompanied by combined resection of the lung, lobectomies, or partial resection of the lung parenchyma. Therefore, postoperative lung function is affected by various factors, and it is difficult to estimate or analyze it.

Lung function in the long-term postoperative period is also important as it decides the quality of life. We focused on recurrence of original tumors and quality of life in this period and did not examine in detail the pulmonary function tests, except for a case of wide sternal resection 15 months after the surgery. In this patient, preoperative vital capacity (VC) and FEV1 were 2.47 l and 2.09 l (84.6%), respectively, decreasing postoperatively to 2.10 l and 1.75 l (82.9%), respectively. In these tests, FEV1 decreased according to decreasing VC, but FEV1% did not decrease relative to VC. Therefore, FEV1 is a more reliable indicator of postoperative lung function than FEV1%.

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