Scanning electron microscopy is a useful modality to visualize the 3-dimensional structures of tissues at high resolution. In addition, processing the tissue samples can provide further architectural information: The removal of connective tissue around the cardiomyocytes and, conversely, the removal of nonfibrous tissue enable us to clearly observe the cardiomyocytes and connective tissue, respectively. Furthermore, backscattered electron emission after heavy-metal staining can provide higher-quality images of the intracellular architecture.1 We have previously reported the 3-dimensional structure of the human left ventricular myocardium.2 Here, we performed an electron microscopic examination of a myectomy specimen from a patient with hypertrophic cardiomyopathy using a Hitachi S-800 scanning electron microscope (Hitachi, Ltd, Tokyo, Japan). In this patient, asymmetrical hypertrophy of the left ventricular wall (interventricular septum, 19 mm; anterolateral wall, 14 mm) and a pressure gradient (85 mm Hg) at the site of left ventricle outflow were demonstrated by ultrasonography.

Compared with a normal heart sample (Figure 1A), disarrayed, overlapping, and abnormally branched cardiomyocytes were observed in the hypertrophic cardiomyopathy heart sample after the removal of connective tissue (Figure 1B and 1C), although the proportion of myocardial disarray seemed to be much greater than in previous studies.3,4 Removal of the nonfibrous segments enabled us to observe thickened interstitial connective tissue, termed plexiform fibrosis (Figure 1E), which is characteristic of, but not specific to, patients with hypertrophic cardiomyopathy.

The backscattered electron image revealed further information at the levels of myofibril orientation and intercalated discs (Figure 2A). At higher magnifications, the A bands and the I bands were identified as broad bright zones and as dark zones, respectively (Figure 2B and 2C). In a normal heart sample, myofibrils are arranged longitudinally in a
regular and parallel pattern. By contrast, disarrayed myofibrils and sarcomeres were also observed in our patient (Figure 2B and 2C).

Disclosures
None.

References
Three-Dimensional Architecture of Cardiomyocytes and Connective Tissues in Hypertrophic Cardiomyopathy: A Scanning Electron Microscopic Observation
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