Pilot study of three-dimensional printing in the surgical rib fixation for the obesity patients with flail chest

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With the vast and fast building constructional speed in China, more constructional workers are accidentally hurt in the building field. With some multiple fractures on multiple ribs, the consequence of flail chest will show some pathophysiological effects on respiratory function on the rib fracture patients. One of the pre-operation preparations for the surgical rib fixation procedure is to as possible as accurately to locate the place of rib fractures. As to the obesity patient with flail chest, with the soft-chest wall and abnormal rib anatomy, sometimes it is difficult to locate the exact positions of the rib fractures. With the development and cost reduction of three dimensional printing, we make a pilot study of the three dimensional printing in the surgical rib fixation for these obesity patients with flail chest. Before the operation we utilized high resolution CT scan to get 2 mm layer DICOM data about the chest rib fractures, then use software to reconstruct the two dimensional data into three dimensional STL files and printing the models with some chemical material with three dimensional printers. The three dimensional printing models working as “sand table”, are effective in more accurately locate the rib fractures, shorter incisions, less operation time and blood loss. We can expect the rapid prototyping of three dimensional printing is a cheap and convenient method to make “sand table” to more effective and accurately navigate in the procedure of rib fixation of obesity flail chest patients.

Biography
Zhang Zhigong is the Vice-Director of Cardio-Thoracic Surgery Department of Hunan Provincial People’s Hospital, President of English Association of Hunan Provincial People’s Hospital and Vice-President of Youth Academic Committee of the Hospital. He has published several papers on reputed journals.

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