



Thoracoscopic Ultrasonic Knife LIMA Acquisition

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Background

Obtaining the left internal mammary artery (LIMA) is currently done using an electrocautery knife under small incisions and direct visualization. This technique is associated with greater damage to the chest wall, poor hemostasis with the scalpel, and multiple use of titanium clips. In contrast, thoracoscopic ultrasonic knife acquisition produces low heat loss to the surrounding tissue.

Methods

32 cases of MICABG patients who underwent LIMA procurement in our hospital during 2023.01-2023.05 were randomly divided into two groups: the experimental group was to use ultrasonic knife to obtain the LIMA under the full thoracoscopic procedure, and the control group was to use the electro-knife to obtain the LIMA under the direct vision of the small incision, to compare and analyze the baseline information of patients in the two groups, the length of the LIMA obtained, the blood flow, the PI, and the time, to evaluate the feasibility and safety of obtaining the LIMA using ultrasonic knife under total thoracoscopy.

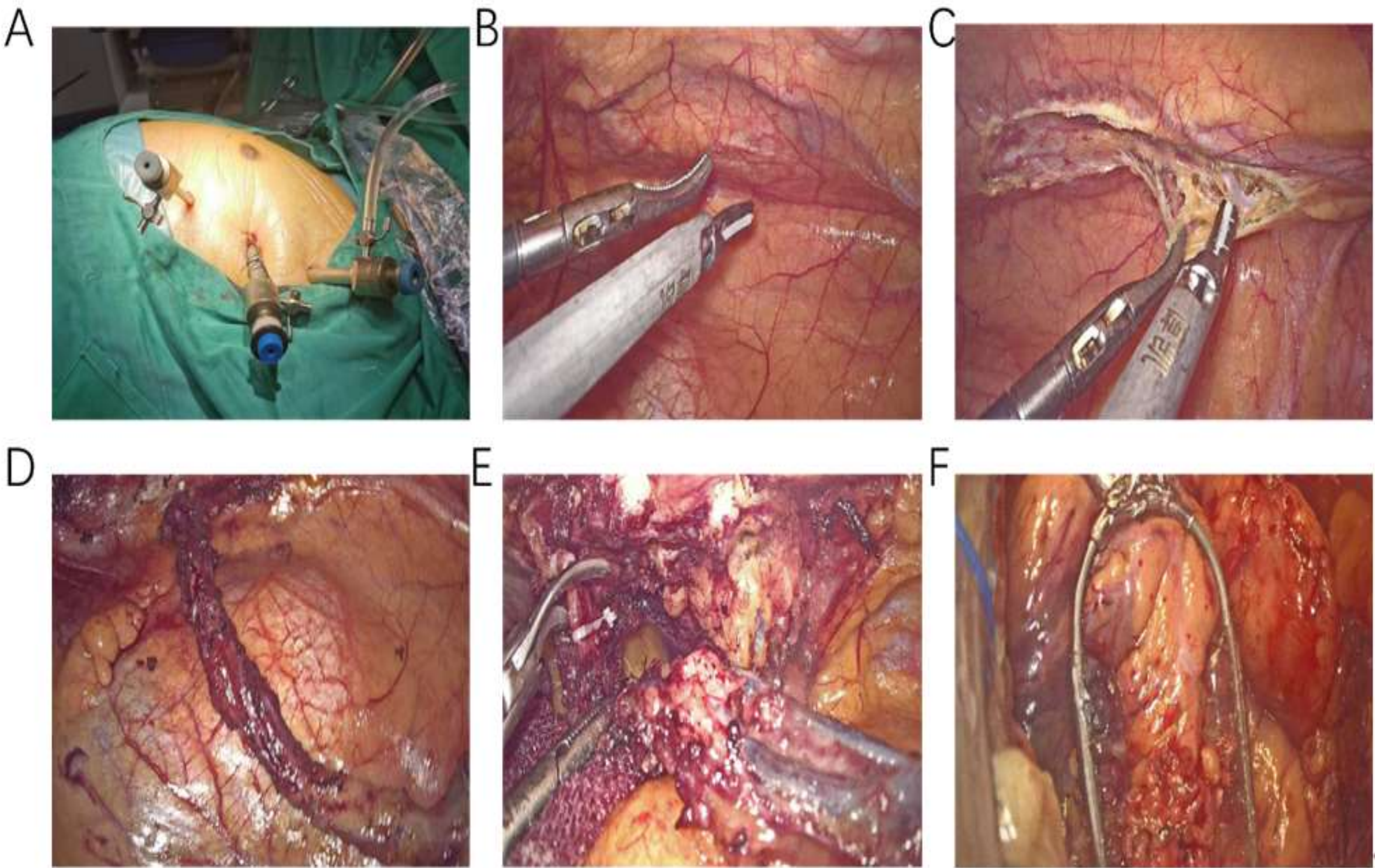
Results

The study comprised eight patients with SinoSCORE II scores ≥ 19 , among whom three were over 80 years old and five had low left ventricular ejection fractions (LVEF). The median operation duration was 220 minutes (range: 175-270), and all patients underwent single-vessel grafting. The LIMA pulsatility index exceeded 1.0 in all cases. Median blood loss was 26 ml (range: 7-300). The median durations of endotracheal intubation and chest drainage were 69 hours (range: 12-144) and 25 hours (range: 16-36), respectively. Immediate postoperative LVEF averaged 34% (range: 20%-70%). ICU stay and hospitalization lasted for a median of 132.5 hours (range: 71-212) and 7 days (range: 6-16), respectively. Complications included atrial fibrillation in one patient, as well as pneumonia and new-onset heart failure in another.

Conclusion

The study suggests that the complete thoracoscopic ultrasonic scalpel-assisted LIMA harvesting in high-risk surgical patients undergoing minimally invasive single-vessel CABG surgery has the potential to be a feasible and safe approach. Further research and larger studies are warranted to confirm these preliminary results.

Figure legend



(A) Position of the three ports. (B) The course of the left internal mammary artery (LIMA). (C) Exposure of the gap between the LIMA and the chest wall. (D) Complete acquisition of the LIMA. (E) Clipping the distal end of the LIMA. (F) LIMA-LAD.