INTRODUCTION: We aimed to identify predictors of conversion to thoracotomy and test the hypothesis that conversion is associated with inferior peri-operative outcomes in non-small cell lung cancer (NSCLC).

METHODS: We queried the National Cancer Database for stage I-III NSCLC patients undergoing minimally invasive surgery (MIS) during 2010-2016. We compared clinicopathological factors between patients undergoing MIS with and without conversion. We fitted multivariate-regression models to identify independent predictors of conversion and compare peri-operative outcomes between the two groups.

RESULTS: 11.4% of the 82,667 cases were converted. Conversion was associated with a higher Charlson comorbidity score, squamous histology, nodal involvement, high tumor grade, tumor size $\geq 5$ cm, and induction chemotherapy ($p<0.05$). Successful MIS (without conversion) was predicted by advanced age, sublobar resection, robotic approach, tumor location in right middle lobe (vs. right upper lobe), and treatment at an academic facility ($p<0.05$). Conversion was linked to longer hospital stays, higher 90-day mortality, and unplanned readmission ($p<0.001$). Conversion from VATS was associated with a higher number of examined lymph nodes (mean: 10.4 with thoracotomy vs. 8.9 with VATS, $p<0.001$), while there was no significant difference with conversion to thoracotomy from the robotic approach (mean: 10.4 with thoracotomy vs. 10.7 with robot, $p=0.26$).

CONCLUSION: Aside from improved nodal harvest following conversion from VATS, conversion correlated with inferior peri-operative outcomes. The robotic approach had a lower likelihood of conversion. Early recognition of the risk factors for conversion may help to better counsel patients about the possibility of conversion or reduce conversion rates altogether by improving patient selection for MIS.

Is Facility Type Associated with Improved Survival in Patients Undergoing Lobectomy for Locally Advanced NSCLC?

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INTRODUCTION: The American College of Surgeons Commission on Cancer designates specific category to cancer programs in the US based on services provided, research, postgraduate education and clinical volume. In this study we compare overall survival and perioperative outcomes for patients undergoing lobectomy for locally advanced NSCLC at academic and community centers.

METHODS: The NCDB was queried for patients with locally advanced NSCLC (node positive disease or tumor size $\geq 5$ cm) who underwent lobectomy between 2010 and 2016. Healthcare facilities were dichotomized into community and academic centers.
INTRODUCTION:

We aim to explore a new method to prove the safety and feasibility of using sodium alginate-Fe₃O₄ magnetic gel to locate small lung nodules before surgery.

METHODS:

The long-term and short-term experiments were carried out with rabbits. Using sodium alginate solution and Fe₃O₄ magnetic powder which with good biosafety to configure magnetic fluid also the calcium gluconate solution as curing agent. In the short-term experiment, a coaxial double-cavity puncture needle was used to inject the magnetic fluid (Tracer Magnet) and calcium gluconate solution simultaneously under open chest vision, and the Nd-Fe-B material (Pursuit Magnet) was used to attract the magnetic gel. In the long-term experiment, percutaneous puncture under X-ray guidance, magnetic fluid and curing agent were injected simultaneously. Determine the positioning effect of the magnetic gel by observing the postoperative complications and the imaging results for 7 consecutive days, and remove the specimens for hematoxylin-eosin staining.

RESULTS:

Experiments were both successful. In the short-term experiment, the magnetic fluid and calcium gluconate solution formed a gel immediately after contacting, without diffusion into the blood, and could protrude from the lung surface to achieve a positioning effect under an external magnetic field. Also there were no postoperative complications after the long-term experiment, the gel no evident change in the position of the shape was observed under X-ray. The positioning effect was ideal, and the pathological results of the gel has clear boundary.

CONCLUSION:

It is preliminarily verified that the sodium alginate-Fe₃O₄ magnetic gel can be used to locate small lung nodules.

Experimental Study of Magnetic Compression Technique for Anastomosis Reconstruction of Esophagus

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INTRODUCTION:

Magnamosis technique has been used in the clinical treatment of congenital esophageal atresia and has achieved good results. This study is to investigate the feasibility of magnetic anastomosis rings designed based on magnetic compression technique in esophageal anastomosis reconstruction.

METHODS:

According to the anatomical characteristics of esophagus in SD rats, the esophageal magnetic anastomosis rings are designed. SD rats are used as animal models (n=10, half male and half female) to complete the magnetic anastomosis reconstruction of the cervical esophagus using magnetic anastomosis rings, and the operation time, animal survival, postoperative complications, magnetic rings excretion time are recorded. Two weeks after operation, the rats are killed, and the esophageal anastomotic specimens are obtained. The blasting pressure of the anastomotic site is measured and the formation of the anastomotic site is observed with naked eyes.

RESULTS:

Esophageal magnamosis is successfully performed in 10 SD rats, and the mean operative time is (10.80±1.66) min (range 8-13 min). All rats survived without anastomatic leakage, anastomatic stenosis, or magnetic rings incarceration. The magnetic rings are discharged on average for (7.60±1.74) days (range 5-10 days) and the blasting pressure is higher than 300mmHg. Visual observation show that the anastomotic muscle heal well and the mucosa is smooth.

CONCLUSION:

The magnetic compression technique can be used for anastomosis reconstruction of esophagus, which has the advantages of simple operation and reliable anastomosis effect, and has clinical application prospect.