

Background: Lung cancer incidence is highest and survival lowest amongst people from socioeconomically deprived groups. Evidence from controlled studies suggests that although mass media lung awareness campaigns can lead to improved symptom awareness, symptom presentation behaviour and stage shift in lung cancer, campaign reach may be limited to more affluent groups. There is a need for interventions targeted at people in deprived communities to encourage earlier lung cancer symptom presentation. Community-based educational strategies are increasingly recognised as having the potential to engage harder to reach groups by challenging deep-seated negative beliefs about cancer through family and social networks.

Methods: The Behaviour Change Wheel was used to guide intervention type, content and delivery. Barriers and enablers to lung cancer symptom awareness were identified from existing sources (a systematic review, qualitative interviews with thirty people living in deprived communities, and six focus groups with people who live or work in deprived communities in Wales) and mapped to the Behaviour Change Wheel. The intervention was tested for acceptability with a group of seven potential users: adults aged over 40 living in a deprived community, who were current/former smokers or family members of smokers. Data from user testing were analysed using observations and before/after questionnaires.

Results: Mapping to the Behaviour Change Wheel suggested that face-to-face group education was a relevant mode of intervention, delivered by a trained, trusted member of the community. Intervention content designed to address identified barriers and enablers included: information about lung cancer symptoms, the benefits of early diagnosis, action planning in the event of symptom experience, strategies to overcome barriers to cancer symptom presentation and aid communication of symptoms during a consultation, and information on how to spot symptoms in other people in the community and what advice should be given. Observations made during the intervention session confirmed that group education was an acceptable mode of intervention delivery. Suggested changes to the intervention included the addition of smoking cessation advice.

Conclusion: A community based educational intervention has been developed to increase lung cancer symptom knowledge, modify negative beliefs and encourage timely symptom presentation by utilising strong social networks in the community. Group-based education was

an acceptable mode of intervention delivery among people in deprived communities, and warrants further feasibility and pilot testing. This research provides an important contribution to evidence regarding effective methods of engaging harder to reach groups in lung cancer early detection.

Keywords: cancer awareness intervention, lung cancer, socioeconomic group, patient delay

PUB023

Effectiveness of Three-Dimensional Video System in Single Port Thorascopic Major Pulmonary Resection: Propensity Score Matched Analysis



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Background: The aim of this study was to evaluate the surgical outcomes of video assisted thorascopic surgery using three dimensional high definition video system compared to two-dimensional system during single port major lung resection by propensity score matched analysis.

Methods: Between March 2012 and December 2015, 213 patients underwent single port thorascopic anatomic lung resection for lung malignancy by one surgeon. The patients who underwent wedge resection or converted to open thoracotomy were excluded from analysis. Patient group was divided into two group: two-dimensional (n=95) and three-dimensional group (n=118). Seventy-six patients of each group were matched using propensity score analysis.

Results: There were no significant differences in operation time (p=0.44), conversion to open thoracotomy (p=0.698) and postoperative complication (p=0.15) between two- and three-dimensional video system for major lung resection. Subgroup analysis showed that procedure times for lobectomy with segmentectomy (p<0.01), sleeve resection (p=0.64), and additional procedure (p=0.10) were likely to be shorter in three-dimensional group. The number of excised mediastinal lymph nodes was not significantly different (p=0.81). Eye discomfort or headache when using glasses for three-dimensional image was not observed in our study.

	2D (n=76)	3D (n=76)	P
Operation time	180 ± 64	188 ± 57	0.439
Lobectomy	166 ± 44	182 ± 55	0.093
Lobectomy+ segmentectomy	224 ± 93	193 ± 137	<0.001
Sleeve resection	173 ± 11	153 ± 31	0.640
Lobectomy+ others	262 ± 96	207 ± 150	0.098
Number of lymph node excision	18.4 ± 10.5	18 ± 8.3	0.811
Conversion to open	4	3	0.698
Modified Clavien-Dindo thoracic complications after thoracic surgery			0.145
Minor grade I	15	12	
II	9	13	
Major grade IIIa	11	13	
IIIb	0	3	
IV	3	5	
Operative mortality	0	0	
Indwelling chest tube drain	5 ± 3	6 ± 4	0.006

Table. Propensity matched analysis.

Conclusion: Three-dimensional video system is a safe and feasible option for minimally invasive major lung resection for lung cancer and might be helpful in performing thoracoscopic complex procedures; segmentectomy, sleeve resection under single port thoracoscopic surgical field.

Keywords: lung cancer, Thoracoscopic surgery

PUB024

Real-Time Computed Tomography Fluoroscopy Guidance in a Rabbit Model of Solitary Lung Cancer



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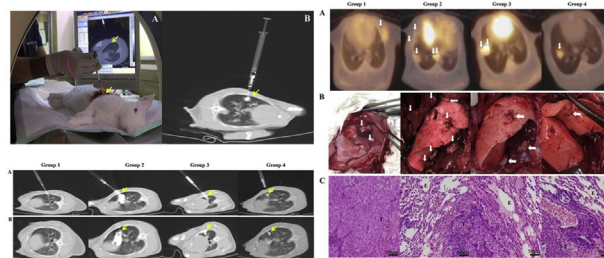
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Background: We evaluate the feasibility and safety of a newly developed solitary lung cancer rabbit model that utilizes real-time computed tomography (CT) fluoroscopy-guided inoculation of VX2 single cell suspensions.

Methods: Thirty-eight rabbits were divided into four groups according to number of VX2 carcinoma cells, Lipiodol amount, Matrigel amount, and injection needle size. The different VX2 tumor cell suspensions were percutaneously injected into rabbits under real-time CT fluoroscopy guidance. Two weeks later, VX2 lung cancers were confirmed by positron emission tomography/CT, necropsy, and histology.

Results: Real-time CT fluoroscopy allowed the precise inoculation of tumor cell suspensions containing Lipiodol. Use of Matrigel and a small-sized needle reduced

spreading and leakage of tumor cell suspensions in the lung parenchyma. Solitary lung cancers were successfully established in all rabbits in group 4 (22/22, 100%); these rabbits were inoculated with 150 μl VX2 tumor cells filtered through a 100 μm cell strainer, 100 μl Lipiodol, and 150 μl Matrigel, using 26-gauge needles. Pneumothorax was observed in only 2 of 38 rabbits (5.3%).



Results of lung cancer modeling in rabbit on positron emission tomography/computed tomography (PET/CT) scan, necropsy, and hematoxylin and eosin (H&E) stain.

Table. The correlations between suspension on computed tomography (CT) guided inoculation and tumor on necropsy

Group (n)	Real-time CT fluoroscopy					Necropsy				
	Suspension location (Incidence, %)					Tumor location (Incidence, %)				
	Lung	Lung and Pleura ^a	Pleural and Thorax ^b	Lung, Pleura and Thorax ^c	No detection	Lung	Lung and Pleura ^a	Pleural and Thorax ^b	Lung, Pleura and Thorax ^c	Thoracic wall ^d
1 (5)	0	0	0	0	5 (100)	0	2 (40)	1 (20)	1 (20)	1 (20)
2 (5)	0	0	2 (40)	3 (60)	0	0	0	0	5 (100)	0
3 (6)	4 (66.7)	2 (33.3)	0	0	0	4 (66.7)	2 (33.3)	0	0	0
4 (22)	22 (100)	0	0	0	0	22 (100)	0	0	0	0

^aLung and Pleural cavity
^bPleural cavity and Thoracic wall
^cLung, Pleural cavity and Thoracic wall
^dTumor was developed in thoracic wall of the injection site.

Conclusion: Real-time CT fluoroscopy-guided inoculation of the appropriate composition of a VX2 tumor cell suspension using a small sized needle is an easy and safe method to model solitary lung cancer in rabbits.

Keywords: Lung cancer animal model, CT guided fluoroscopy

PUB025

Comparison of Surgical Outcomes between Multiport and Single Port Thoracoscopic Lobectomy for Lung Cancer: Propensity Score Matched Analysis



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Background: We evaluated operative outcomes of single port thoracoscopic lobectomy compared to conventional multiport thoracoscopic lobectomy to determine its safety and oncologic efficacy by propensity score matched analysis.