

Higher Resection Rates are Associated with Better Survival in Lung Cancer

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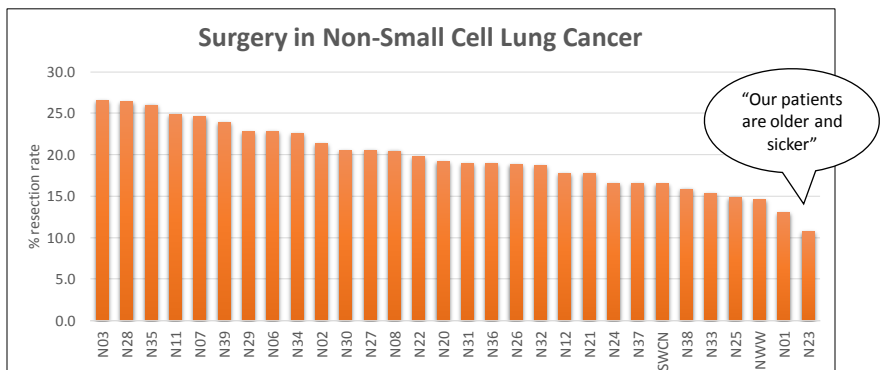
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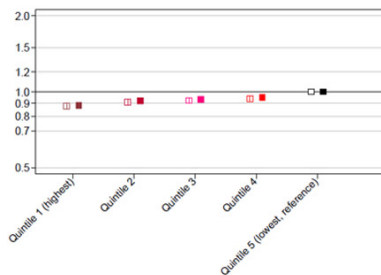
Introduction

- Outcomes for lung cancer patient in the UK are poor compared to other similar healthcare systems.
- Outcomes vary widely within the UK.



Why Increase Resection Rates?

The National Lung Cancer Audit (sponsored by the Healthcare Quality Improvement Partnership) has focussed on increasing radical treatment rates, especially curative surgery in NSCLC, but it has proven difficult to link higher resection rates with improved survival at a local level.



Compared to the highest resection quintile:

- 5420 deaths could be delayed in the overall NSCLC group;
- 46 more deaths could be expected amongst the resected patients

Variation in surgical resection for lung cancer in relation to survival: population-based study in England 2004-2006.
Riaz et al, Eur J Cancer. 2012 Jan;48(1):54-60. doi:10.1016/j.ejca.2011.07.012. Epub 2011 Aug 24.

Hypothesis

- MDTs vary in their assessment of the risk/benefit of surgery.
- MDTs which refer more patients for surgery have better survival outcomes.

Methods

- NLCA data - England only, 2008-2011 inclusive
- All cases of stage I and II NSCLC
- Divided local trusts into quintiles according to their resection rates in patients first seen in that organisation:
 - Q1=lowest resection rates
 - Q5=highest resection rates
- Excluded trusts with <25 cases (Stage I/II) in the study period.
- These resection rate quintiles have been used in a Cox proportional hazards model, adjusted for age, stage, sex, PS, deprivation and co-morbidity to assess the relationship between resection rate and survival.

Audit Population

	IA	IB	IIA	IIB	Total
2008	881	1,472	127	855	3,335
2009	1,257	1,890	176	1,194	4,517
2010	1,487	1,580	636	1,187	4,890
2011	1,777	1,571	1,051	1,000	5,399
Total	5,402	6,513	1,990	4,236	18,141

118,866 cases submitted to the audit during the study period

Resection Rates

	Stage I (%)	Stage II (%)	Stage I & II (%)
Q1	22.5 - 43.0	12.5 - 35.7	20.4 - 42.9
Q2	43.2 - 51.2	36.0 - 41.5	43.3 - 48.6
Q3	51.5 - 56.9	41.7 - 47.2	48.6 - 53.3
Q4	57.1 - 64.0	47.6 - 53.9	53.5 - 58.5
Q5	64.3 - 84.6	54.2 - 79.2	59.4 - 82.0
Overall	54.2	44.3	50.8

Survival

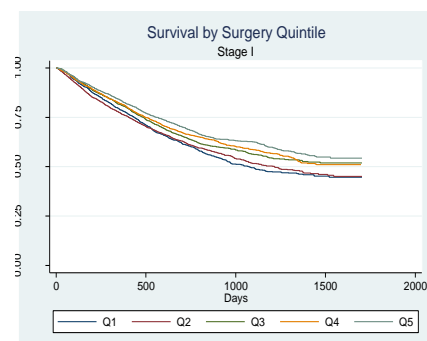
- Survival figures below are based on all patients in a stage grouping, both resected and un-resected
 - HR=hazard ratio
 - 1YS=1 year survival
 - 3YS=3 year survival

Stage 1

	1YS	3YS	Median survival
Q1	78.6%	49.5%	35.8 months
Q2	76.7%	51.7%	40.5 months
Q3	81.1%	56.3%	Not reached
Q4	81.8%	58.6%	Not reached
Q5	83.3%	62.5%	Not reached
Total	80.2%	55.8%	48.3 months

Stage 1

	HR	p	95% CI
Q1	1.0	-	-
Q2	0.94	0.175	0.85 – 1.03
Q3	0.95	0.282	0.85 – 1.05
Q4	0.87	0.008	0.79 – 0.97
Q5	0.86	0.006	0.78 – 0.96



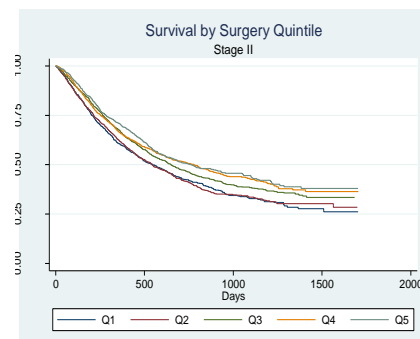
There is a statistically-significant and clinically relevant improvement in survival in the organisations with the highest resection rates (HR 0.86 in Q5).

Stage 2

	1YS	3YS	Median survival
Q1	60.0%	32.8%	18.2 months
Q2	61.5%	33.5%	18.0 months
Q3	66.7%	38.4%	21.6 months
Q4	65.8%	42.8%	25.9 months
Q5	70.3%	44.6%	25.2 months
Total	64.7%	38.1%	21.0 months

Stage 2

	HR	P	95% CI
Q1	1.0	-	-
Q2	1.08	0.157	0.97 – 1.20
Q3	0.92	0.136	0.82 – 1.03
Q4	0.92	0.191	0.82 – 1.03
Q5	0.94	0.344	0.83 – 1.06



Although the HRs do not reach statistical significance, there is a clinically relevant improvement in survival in the organisations with the highest resection rates (3YS 44.6% Q5, 32.8% in Q1).

Combined Results – Stage I&II

- 3YS 55.9% vs 45.1%
- Median survival 47.0 months vs 29.6 months
- HR 0.84 vs 1.0, $p < 0.001$

Conclusions

1. Patients with Stage I and II NSCLC first seen in trusts with higher resection rates have longer median survival, 1 year survival and 3 year survival.
2. This improved survival is independent of variation in key patient-level clinical features.
3. The use of the NLCA co-morbidity field may not accurately reflect the burden of co-morbidity in the patient population with potential implications for the results if an alternative co-morbidity estimate were used.
4. However, the results lend weight to the hypothesis that improving resection rates in some trusts has the potential to improve overall survival for lung cancer.

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