

2023 대한심장혈관흉부외과학회

제55차 추계학술대회 & APELSO 2023

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**Prognosis after surgical treatment of lung cancer with multiple ground-glass nodules:
the effect of nodule characteristics**



- Lung cancer with synchronous multiple ground glass nodules (GGN) are detected more commonly as the use of low-dose chest computed tomography screening is increasing .
- There is still no clear guideline for the management and surveillance of lung cancer with multiple GGNs.
- We analyzed the effect of tumor characteristics on long-term prognosis after surgical outcomes of lung cancer with multiple GGNs.

- Total of 284 patients who underwent pulmonary resection for the treatment of lung cancer with synchronous multiple GGNs from January 2013 to December 2019 were reviewed retrospectively.
- Patients were divided into three group according to the consolidation-tumor ratio (CTR) on computed tomography of dominant nodule.
 - PSN-1 group ($0 \leq \text{CTR} < 0.5$), PSN-2 group ($0.5 \leq \text{CTR} < 1$) and solid group ($\text{CTR} = 1$).
- Definition of dominant tumor – the most invasive tumor based on radiologic size and CTR.
- End points
 - Overall survival - entire population, subgroup analyses
 - Pattern of distribution of non-dominant nodules
 - Pattern of pulmonary resection
 - Prognosis of non-dominant nodules – progression rate, secondary treatment

Table 1. Study population characteristics

Characteristic	Result (n=284)
Age (y, mean±SD)	64.71±9.62
Sex	
Male	113 (39.8%)
Never smoker	191(67.3%)
Previous cancer history	62 (21.8%)
No. of lesions	
2	99 (34.9%)
3	148 (52.1%)
4 or more	37 (13.0%)
Laterality	
Unilateral	120 (42.3%)
Same lobe	43 (15.2%)
Different lobe	77 (27.1%)
Bilateral	164 (57.7%)
CT image characteristics of dominant nodule	
Part-solid-1 (0≤CTR<0.5)	114 (40.2%)
Part-solid-2 (0.5≤CTR<1.0)	106 (37.3%)
Solid	64 (22.5%)

TREATMENT PATTERN

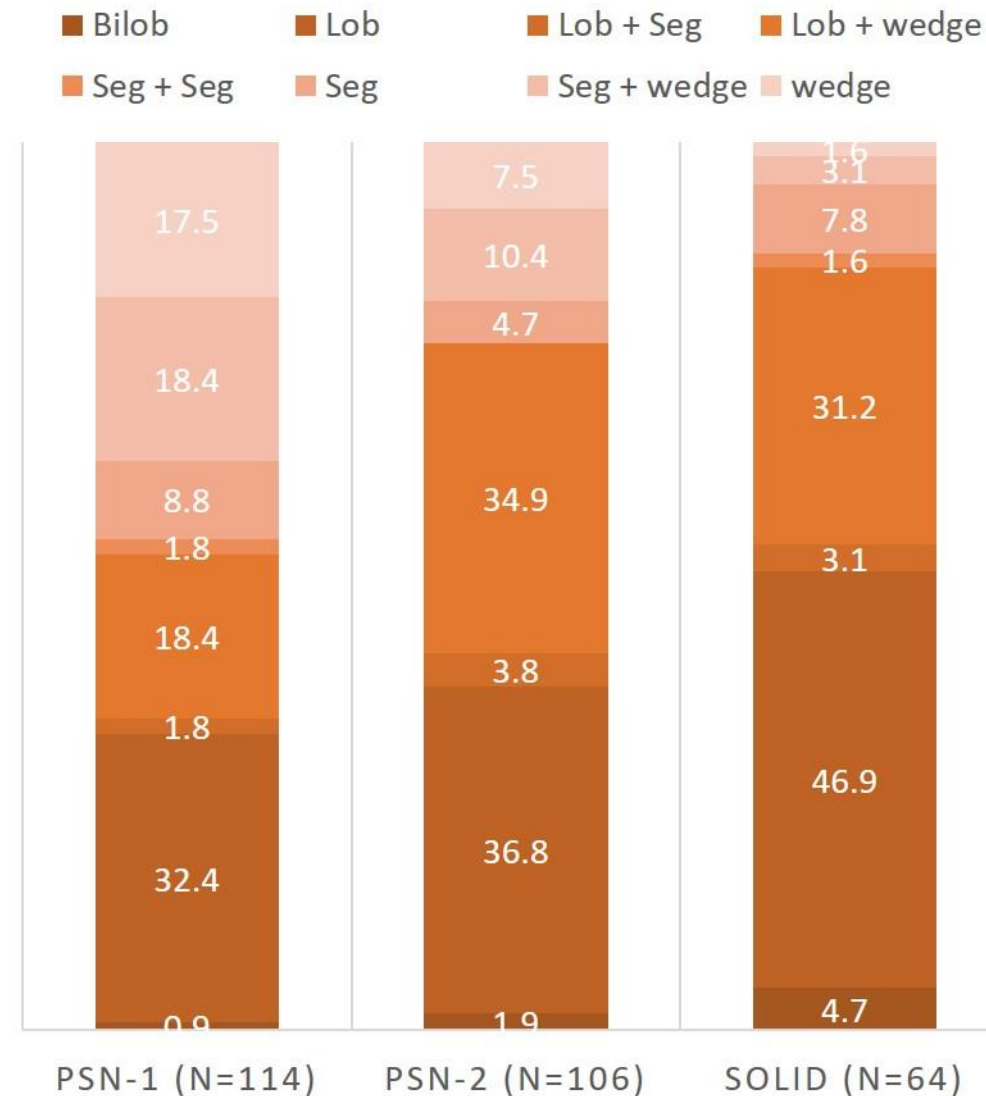


Table 2. Postoperative outcomes

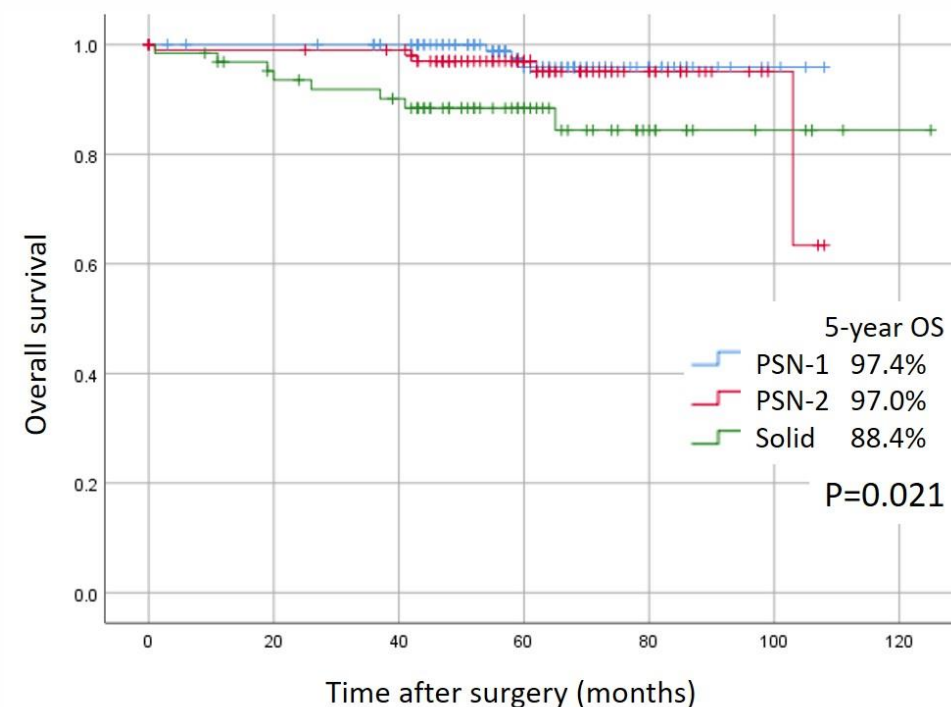
Median f/u time	60.7 months
30-days mortality	1 (0.3%) patient
Recurrence	20 (7%) patients
Death	16 (5.6%) patients

Table 3. Residual nodules after initial surgery

Residual nodule	Yes (n=177, 62.3%)	No (n=107%, 37.7%)	P-value
Progression	47 (26.6%)	-	-
New nodules	11 (6.2%)	11 (10.3%)	
2 nd intervention	59 (33.9%)	7 (6.5%)	
surgery	54 (91.5%)	5 (71.4%)	
5-year OS rate	96.8%	90.9%	0.029

	PSN-1 (n=114)	PSN-2 (n=106)	Solid (n=64)	total
Recurrence	0	9 (8.5%)	11 (17.2%)	20
Residual nodules	75 (65.8%)	67 (63.2%)	35 (54.7%)	177
Progression *	17 (25.3%)	16 (15.1%)	14 (21.9%)	47
New lesion	4 (3.5%)	7 (6.6%)	11 (17.2%)	22
2 nd intervention	21 (35.9%)	22 (10.8%)	23 (35.9%)	66
surgery	21 (100%)	19 (86.4%)	17 (73.9%)	57
Death	3 (5.5%)	5 (4.7%)	8 (12.5%)	16

* In patients with residual nodules



- The invasiveness of dominant tumor was the most important factor for long-term prognosis in lung cancer with multiple GGNs.
- Progression of residual nodule caused secondary intervention in 1/3 of patients with residual nodules.
- However, progression of residual nodule did not jeopardize the survival.
- So, curative surgery for the dominant nodule is essential and close surveillance and timely intervention for residual GGNs should be carried out in lung cancer patients with multiple GGNs.