KALC 2022 Korean Association for Lung Cancer International Conference
November 10-11, 2022 | Lotte Hotel World, Seoul, Korea

COMPARISON FOR EGFR MUTANT EXPRESSIONS BETWEEN EARLY STAGE AND ADVANCED STAGE NON SMALL CELL LUNG CANCER

Presenter: NGUYEN SON LAM Msc.MD.

Pathological Department, Pham Ngoc Thach Hospital, Vietnam - Telephone: +84 0913148308 - Email: drnsl1963@gmail.com

Co-Author: PHAM NGUYEN CUONG PhD.MD.

Pathological Department, Central Hue Hospital, Vietnam - Telephone: +84 0914006781 - Email: bscuonggpb@gmail.com

Background & Aim

The investigation of EGFR gene mutations in NSCLC is usually performed in the advanced stage, when the possibility of surgical resection on this tumor is often very low. The investigation of EGFR mutations in the early stages of NSCLC has been more recently done. Since then, there are clinical applications that is taken to many benefits to patients.

We conduct research with the following objectives:

1. ***Investigation of EGFR mutation expression in early and advanced NSCLC.***
2. ***Compare the results have obtained from these two pathological groups. Since then, we have been making clinical applications on NSCLC patients at PNT Hospital.***

Methods

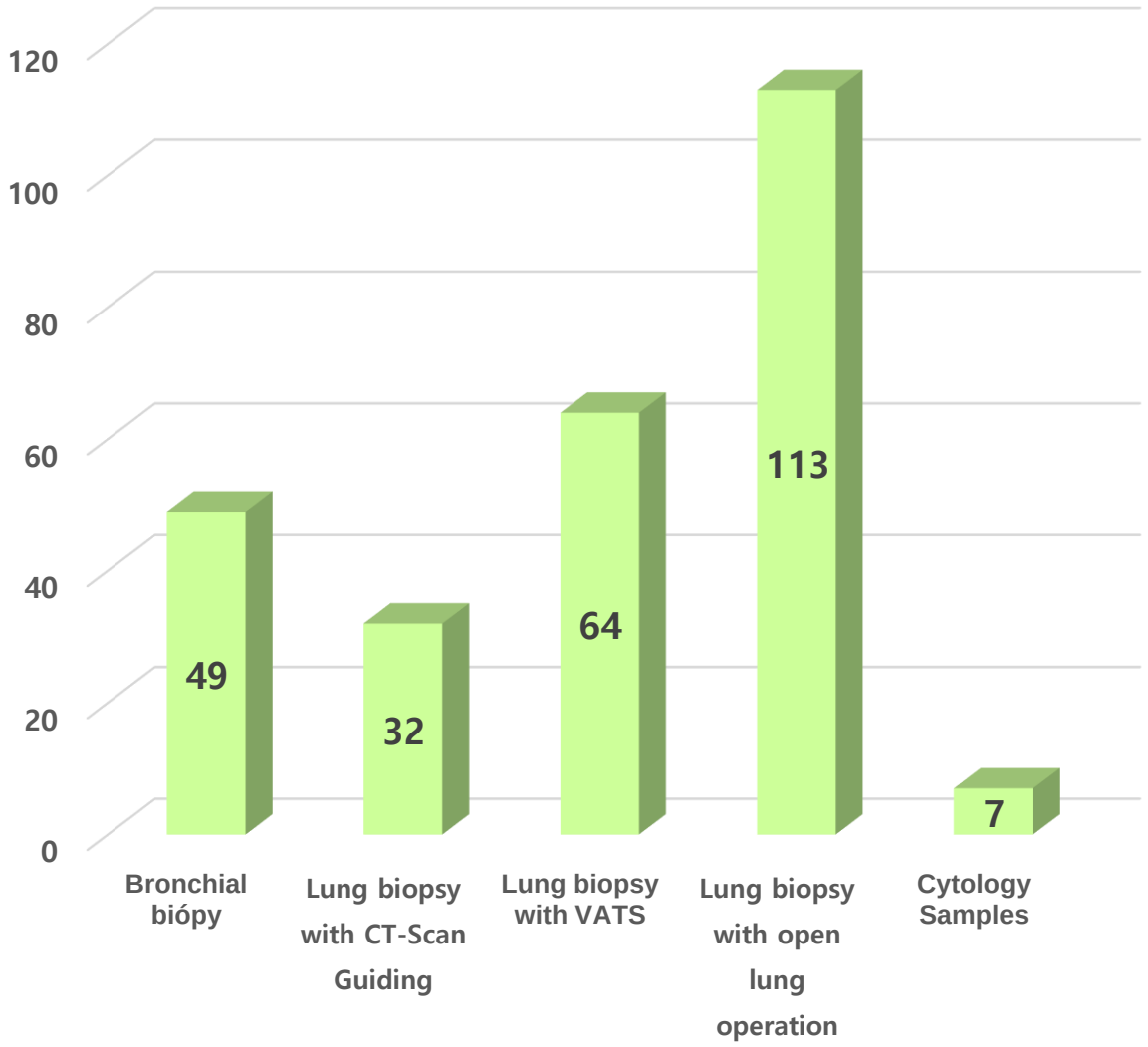
- All patients with NSCLC, regardless of disease stage, were hospitalized for treatment at PNT Hospital in 2021
- The patients with pathological diagnosis were NSCLC and were diagnosed with EGFR mutations.
- The conventions for dividing two groups of study patients:
  - ❑ *Early stage NSCLC: patients with stages I - IIIA and patients capable of surgical resection of the lung tumor.*
  - ❑ *Advanced stage NSCLC: patients with stages IIIB - IV and unable to undergo surgical resection of the lung tumor.*
- Prospective, cross-sectional descriptive statistics.
- Analysis with SPSS 20.0 software.
- Two-way analysis with T-Test, test value with $P < 0.05$.
- Diagnosis for EGFR mutations with cobas z 480 system by Test-Kit Version 1 & 2

Results

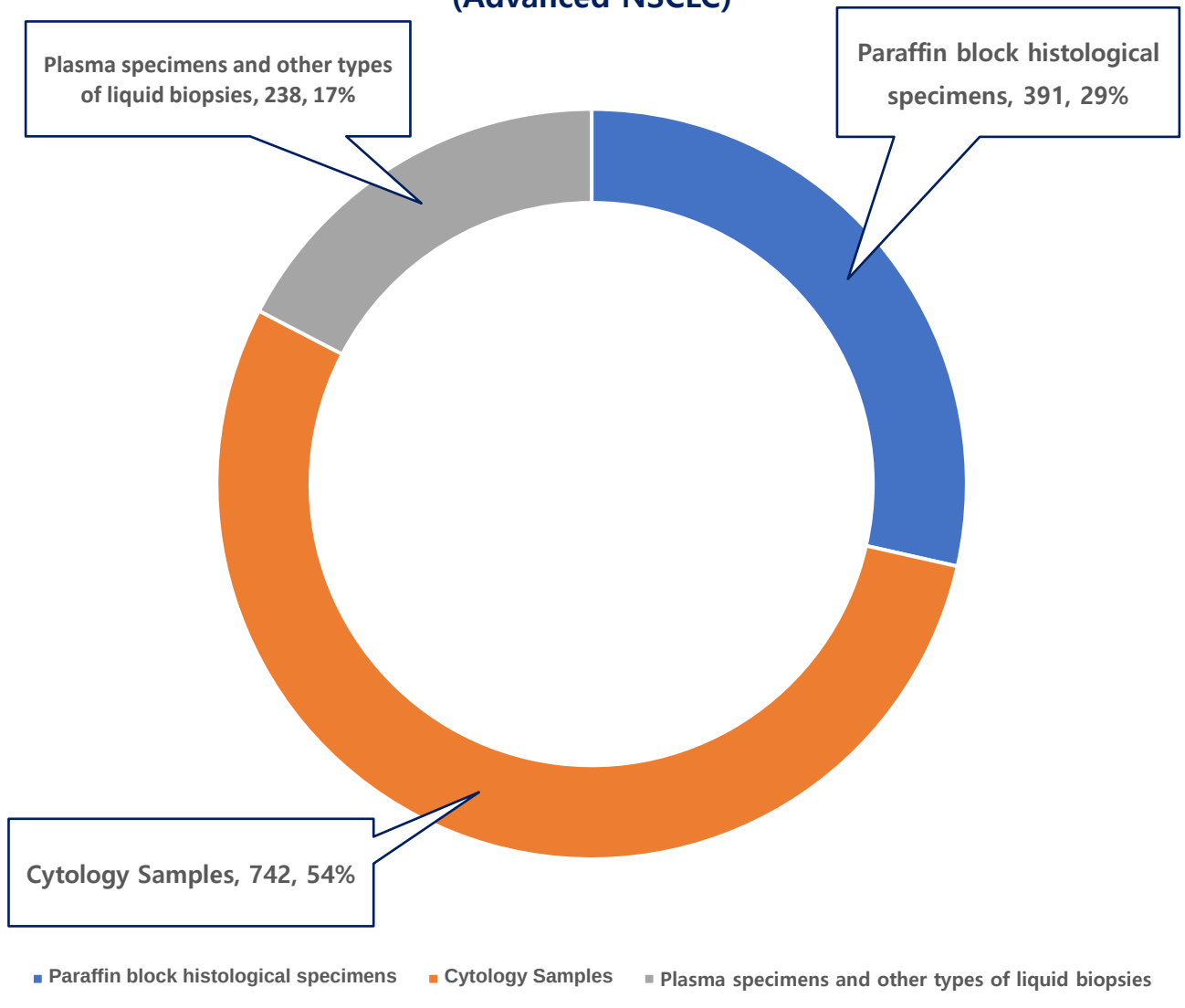
EGFR mutation in early stage NSCLC	EGFR mutation in advanced stage NSCLC
• EGFR mutation diagnosis in early stage NSCLC/2021: 267 cases	• EGFR mutation diagnosis in advanced NSCLC/2021: 1371 cases
• Performed Technics: RT-PCR on cobas® z 480 & Test-Kit Ver 1	• Performed technics: RT-PCR on cobas® z 480 + Test-Kit Ver 1 & 2
• Specimen: biopsy tissue	• Specimens: histology, cytology & plasma + liquid biopsy samples
• Gender: Male: 105 cases (39.33%), Female: 162 cases (60.67%)	• Gender: Male: 639 cases (46.61%) - Female: 732 cases (53.39%)
• Average age: 59.68 ± 9.34 years old	• Average age: 61.73 ± 9.35 years old
• Smoking status: 74 cases (27.72%)	• Smoking status: 487 cases (35.52%)
• EGFR mutations have detected: 111 cases (41.57%)	• EGFR mutations have detected: 565 cases (41.21%)
• Number of cases without EGFR mutations: 156 cases (58.43%)	• Number of cases without EGFR mutations: 806 (58.79%)

Comparison of general data between two groups of NSCLC patients

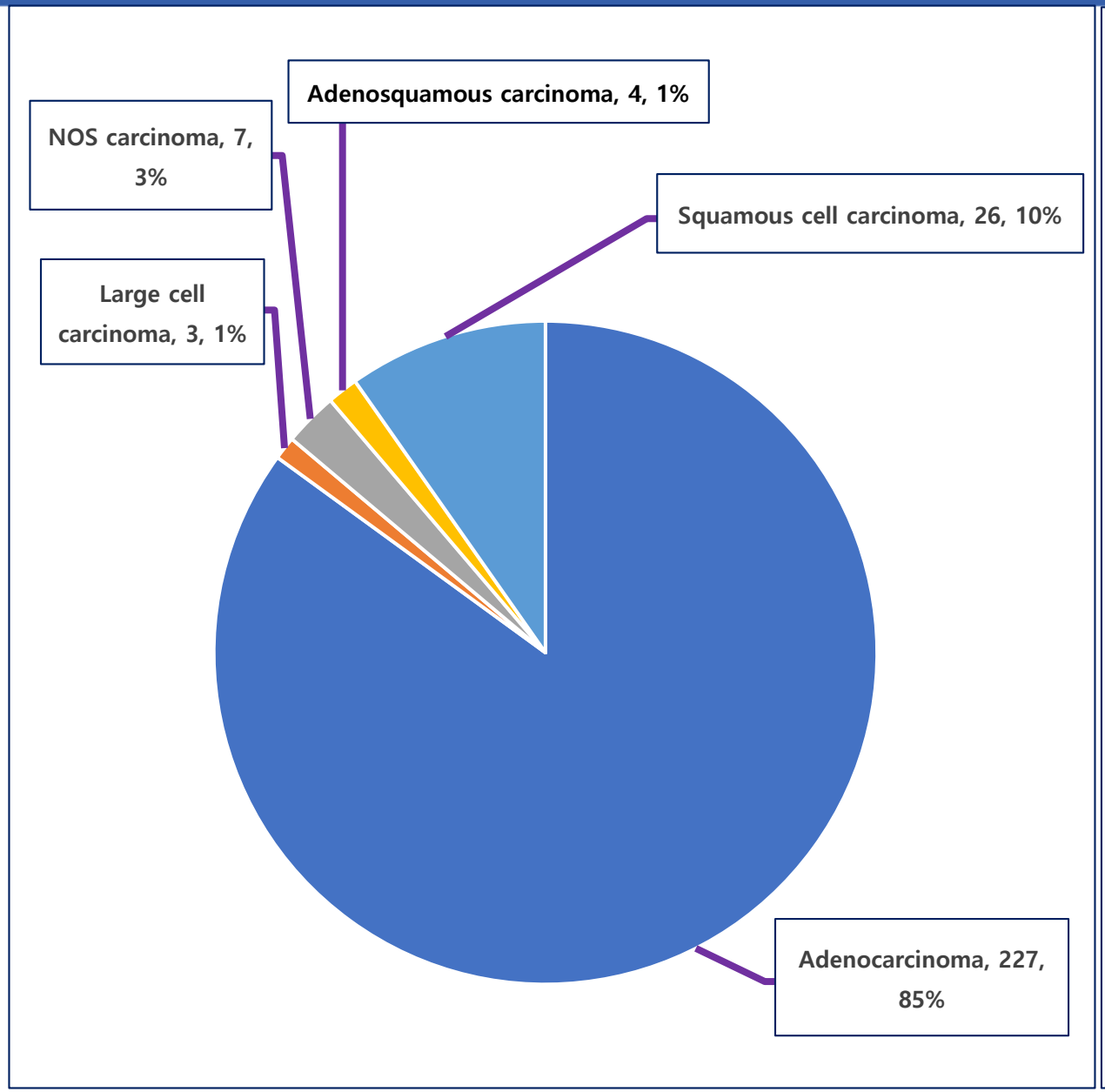
Distribution of samples for diagnosis of EGFR Mutations (Early stage NSCLC)



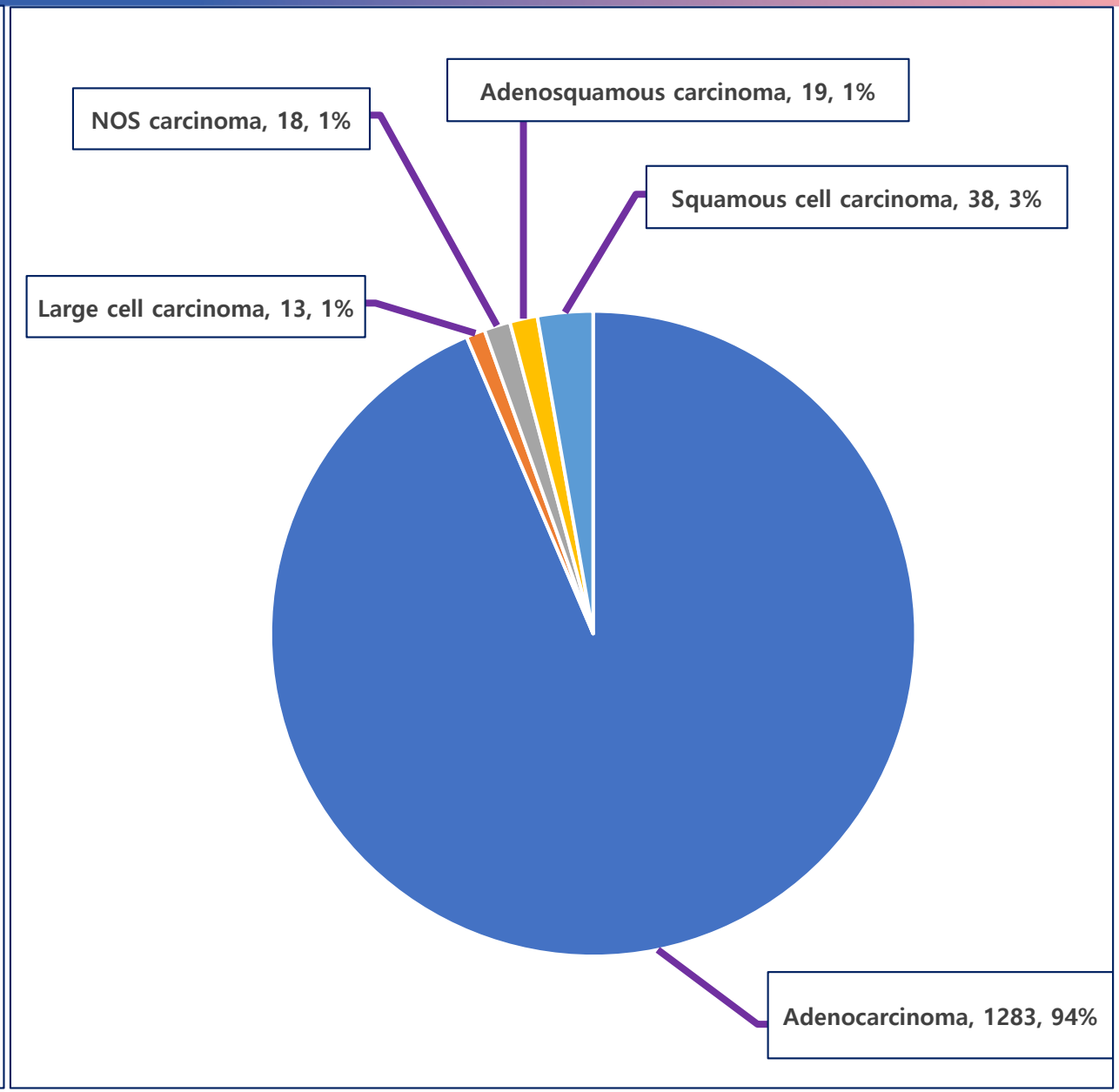
Distribution of samples for diagnosis of EGFR Mutations (Advanced NSCLC)



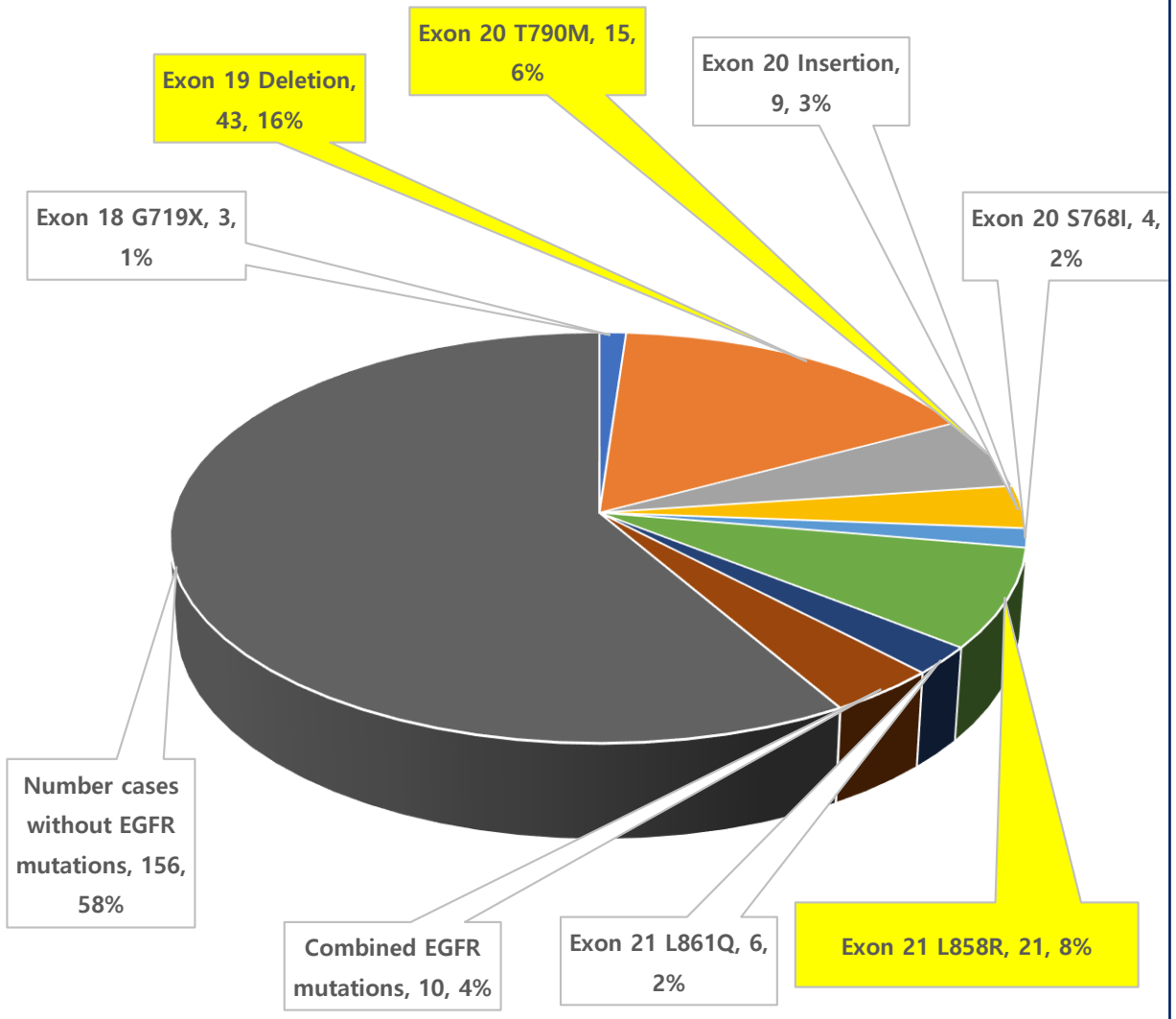
Comparison of samples to diagnose EGFR mutations between two groups of diseases



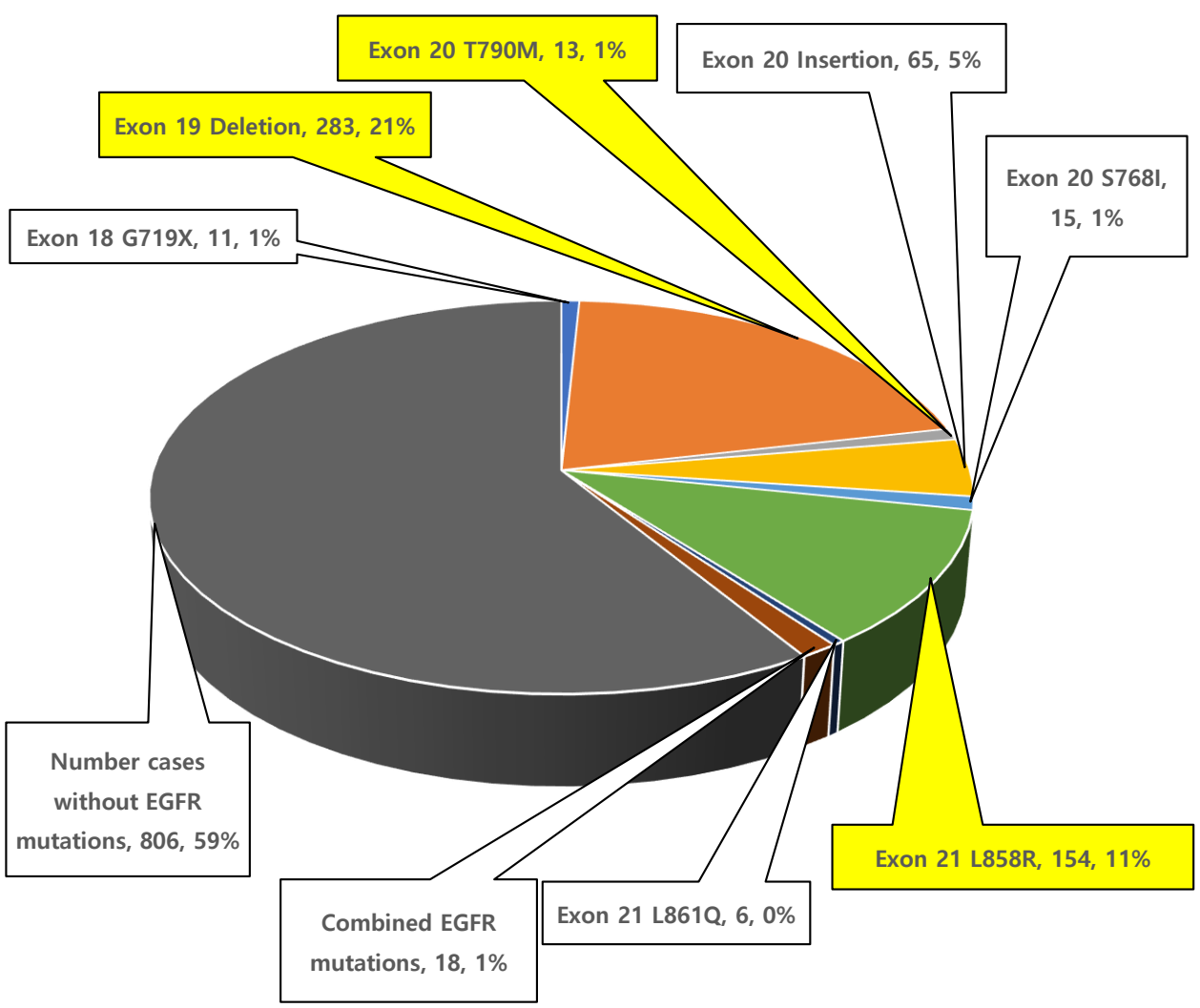
Distribution of histological classifications for EGFR mutations in early stage NSCLC



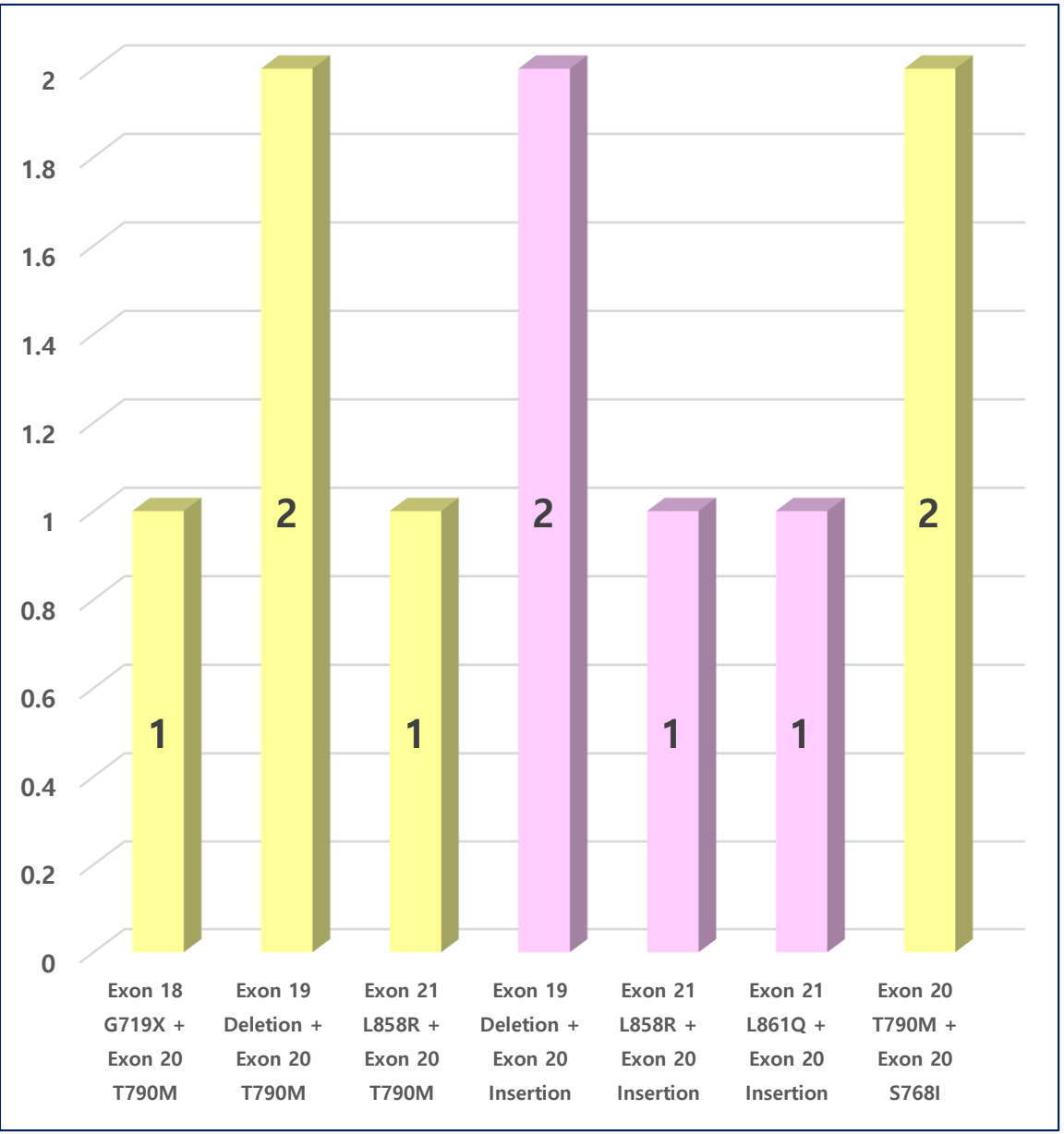
Distribution of histological classification for EGFR mutations in advanced NSCLC



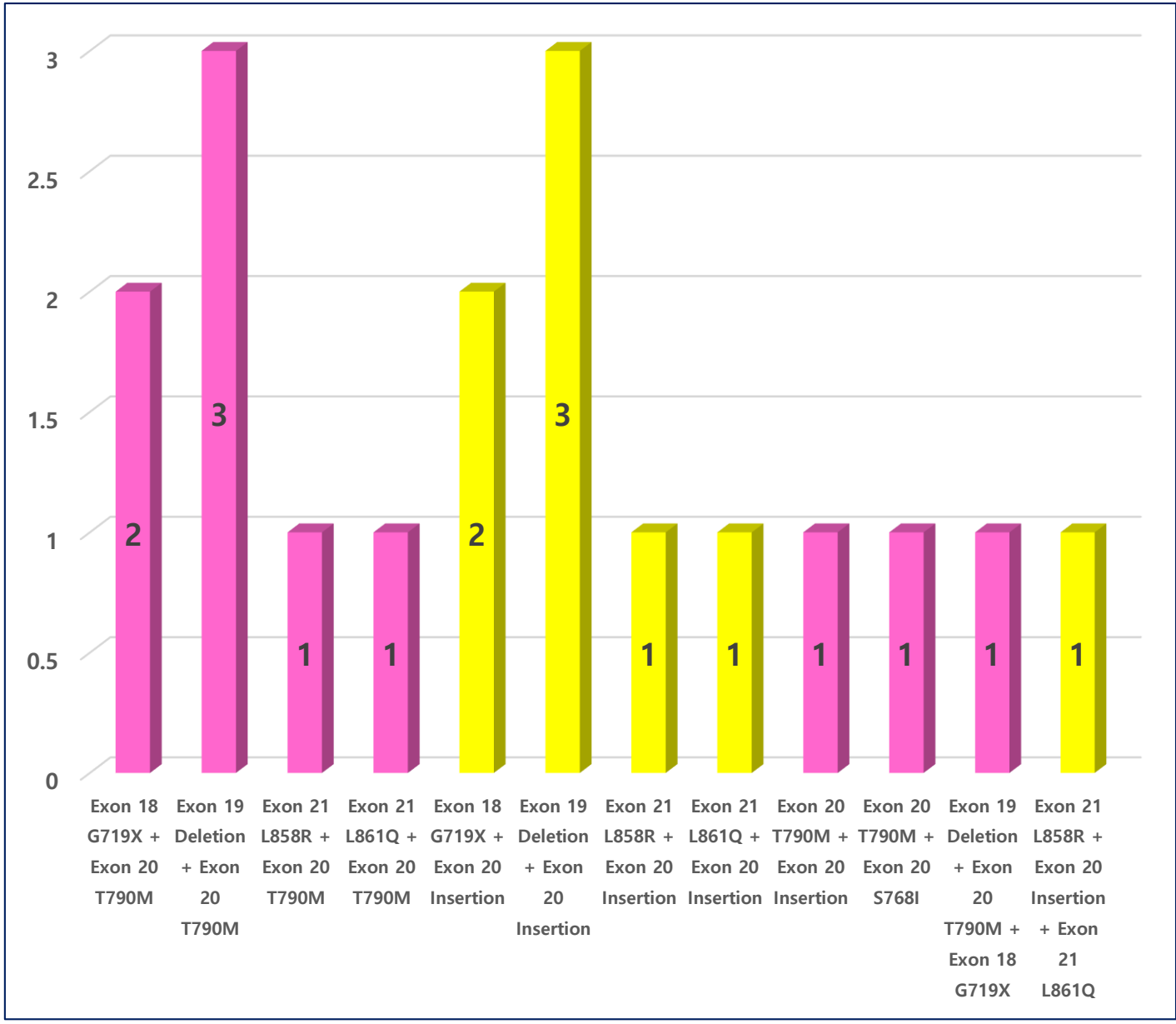
Distribution of subtypes EGFR mutations in early stage NSCLC



Distribution of subtypes EGFR mutations in advanced stage NSCLC



Combined EGFR mutation patterns in early stage NSCLC



Combined EGFR mutation patterns in advanced stage NSCLC

Genetic alternations	Early NSCLC	Advanced NSCLC	P-Value
Detective EGFR mutation rate	187 ca # 38,09%	725 ca # 39,13%	0,3783
Rare EGFR mutations	- Exon 18 G719X: (5 case single mutation + 1 case com -bined mutation) 6 cases # 3,21% - Exon 20 Insertion: (11 cases single mutation + 5 cases combined mutation) 16 cases # 8,56% - Exon 20 S768I: 9 cases # 4,81% - Exon 21 L861Q: (13 cases single mutation + 2 cases c- ombined mutation) 15 cases # 8,02%	- Exon 18 G719X: (15 cases single mutation + 6 ca co- mbined mutation) 21 cases # 2,89% - Exon 20 Insertion: 61 cases single mutation + 11 cas- es combined mutation) 72 cases # 9,93% - Exon 20 S768I: (16 cases single mutation + 2 cases c- ombined mutation) 18 cases # 2,48% - Exon 21 L861Q: (13 cases single mutation + 5 cases c -ombined mutation) 18 cases # 2,48%	0,0907 0,0863 0,0515 0,0309 (< 0,05)
TKIs sensitive EGFR mutation	- Exon 19 Deletion: (77 cases single mutation + 8 ca co -mbined mutation) 85 cases # 45,45% - Exon 21 L858R: (36 ca single mutation + 4 ca combin- ed mutation) 40 cases # 21,39%	- Exon 19 Deletion: (391 cases single mutation + 12 c- ases combined mutation) 403 cases # 55,59% - Exon 21 L858R: 184 cases single mutation + 3 cases combined mutation) 187 cases # 25,79%	0,0817 0,0829
EGFR Exon 20 T790M mutation	(17 cases single mutation + 14 cases combined mutation) 31 cases # 16,58%	(18 cases single mutation + 14 cases combined mutation) 32 ca # 4,41%	0,0265 (< 0,05)

General comparison table of EGFR gene mutations between two groups of diseases Early stage & advanced stage NSCLC

Conclusions

- There is really a need to perform the diagnosis of EGFR mutations in the early stages of NSCLC.
- EGFR mutations in early and advanced NSCLC have almost the same subtype distribution, except for EGFR mutations Exon 21 L861Q and Exon 20 T790M.
- There are being broader indications for second and third generation TKIs.