In France recognition of OLC is considered as insufficient. Moreover some asbestosis or other inorganic dust exposure may be related to an environmental factor. Since 2002 SQ, introduced by a common action of the French Pneumology Society and the French Occupational Society, has reduced this underestimation. For operated lung cancer patients, LTLMA may also improve dust disease’s recognition (1). Finally combination of SQ and LTLMA could offer to operated lung cancer patients the best approach to identify OLC and other environmental lung cancer (ELC).

II - POPULATION AND METHODS

A) Population

Population : 59 patients recruited between July 2004 and December 2008 among 510 new lung cancers underwent thoracic surgery with systematic LTLMA. Table 1 gives patients characteristics: 46 males, 13 females, 50 smokers or ex-smokers, mean age : 64 years, 19 Stage I (42%), 12 Stage II (20%), 19 Stage III (32%), 3 Stage IV (6%). Pulmonary biopsy was systematically realized after resection (54 cases) or thoracotomy or thoracoscopic (5 cases) from lung tissue without tumour involvement.

B) Occupational enquiry

SQ was submitted patient during lung cancer announcement consultation by medical team. If SQ was not documented, past professional activities notified in patient’s observation were analysed in correlation with SQ.

C) Lung Tissue Light Mineralogical Analysis

Preparation samples : specimens were digested by sodium hypochlorite and collected on cellulose esters filters (pore size : 0.45 µm), dried and fixed on glass slides by fusion in acetone vapours. Light microscopy : magnification x 400, transmitted light and phase contrast.

Counting : asbestos bodies (AB), uncoated fibres (UF) longer than 15 µm, fribrous bodies (FB) on opaque fibre (FBOF), FB on opaque particle (FBOF) and FB on transparent particle (FBTP) with the largest diameter of particles greater than 15 µm (fig 1). Results are expressed in % of dry weight of lung tissue (gdw).

D) Statistical analysis

Descriptive statistics (geometric mean, median, quartiles 25%, 75%) are used to describe the features of the data in this study. The Wilcoxon matched-pairs signed-rank test was used for comparison of the particle concentrations observed between this lung cancer population and our control population pulmonary tissue. A p value below 0.05 was considered significant. All analyses were done using R (http://www.r-project.org).

III - RESULTS

A) Lung cancer cases : figure 2 describes the data of the 59 lung cancer series. The geometric mean of AB, UF, FBOF, FBFP and FBTP are respectively : 190, 445, 48, 85 and 49 gdw.

B) Dusty lung cancers : table 2 reports sex, smoking habit, age, histology, clinical stage of the 20 OLC and 2 environmental non OLC selected combining SQ and LTLMA. Figure 2 describes the data of this 22 dusty lung cancer series. The geometric mean of AB, UF, FBOF, FBFP and FBTP are respectively : 586, 1140, 60, 214 and 79 gdw.

C) Non smoker lung cancers

Table 3 reports the results of the 9 non smoker lung cancers. The geometric mean of AB, UF, FBOF, FBFP and FBTP are respectively : 145, 316, 36, 114 and 79 gdw.

IV - DISCUSSION

1/ Identification of OLC by combination of LTLMA and SQ

- Mollo et al (2) among 924 non selected surgical cases of lung carcinoma report 116 cases (12.5%) with more than 1000 AB/gdw.

- Dumontier et al (3) in a multi-centre retrospective study of 1931 cases, report 13.3% cases with high level AB.

- Our 10/59 (16%) patients with high level in this monocentric study are in accordance with other studies. Among 8 other asbestos occupational cases, 2 patients present elevation AB level at 900 and 930 near the threshold at 2 high level UF. Comparing the data of the 59 lung cancers with our population control (autopsy of subjects resident in an urban and peri urban setting, not occupationally exposed to industrial dusts and with no pneumococcal), means of AB and UF are significantly different with a p = 0.05.

- Standardized Questionnaire

In Legrand Cattan (4) mono-centric prospective study among 207 LC, only 122 (60%) could respond to a complete SQ. Among them 32 (26% of SQ completed and 15% LC population) could have claim for compensation. SQ may be often incomplete in clinical practice : bad clinical status patient, linguistic barrier, refusal or forgetting patient, many temporary occupational activities, only surgical hospitalization.

2/ Combination of SQ and LTLMA

This combination allows to identify 20 OLC, 18 asbestosis OLC, 2 silico LC. For 8/20 patients, LTLMA is essential before confirmation by SQ data. Moreover, 2 environmental dusty lung cancers are identified : one case with dusty construction hobby and one with silicotic lymph node and very high FBFP level.

So combination SQ and LTLMA may identify 37% dusty lung cancer and may improve claim for compensation.

V - CONCLUSION

The addition of LTLMA to SQ improves occupational or environmental non occupational recognition. Systematic LTLMA or specimen stock are recommended systematically after lung cancer resection and for low or non smoker. Mineralogical analysis may be realised only if SQ is insufficient.

BIBLIOGRAPHY

1) Henderson OW et al ; Pathology 2004 ; 36 : S17 – S20
4) Legrand Cattan A et al. ; Rev Mal Resp 2008 ; 25 : 675 – 682