|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristic (n, %) | HPVpos(n=23) | HPVneg/p53wt(n=20) | HPVneg/p53abn (n=22) | *p*-value |
| Age – yr (median, range) | 60 (40-89) | 70.5 (47-91) | 77.5 (41-86) | **0.013** |
| Smoking (n, %) |  |  |  | **0.005** |
|  No | 5 (21.7%) | 12 (60%) | 14 (63.6%) |  |
|  Current | 15 (65.2%) | 3 (15%) | 3 (13.6%) |  |
|  Non-current | 1 (4.3%) | 2 (10%) | 1 (4.5%) |  |
|  Unknown | 2 (8.7%) | 3 (15%) | 4 (18.2%) |  |
| Immunosuppression  |  |  |  | - |
|  HIV | - | - | - |  |
|  Immunosuppressive | 2 (8.7%) | - | - |  |
| FIGO stadium  |  |  |  | 0.429 |
|  IA | 2 (8.7%) | 1 (5%) | - |  |
|  IB | 21 (91.3%) | 19 (95%) | 21 (95.5%) |  |
|  II | - | - | - |  |
|  IIIA | - | - | 1 (4.5%) |  |
| Size tumor in cm  |  |  |  | 0.450 |
|  ≤2cm | 15 (65.2%) | 9 (45%) | 10 (45.5%) |  |
|  2-4cm | 5 (21.7%) | 7 (35%) | 6 (27.3%) |  |
|  ≥4cm | 2 (8.7%) | 4 (20%) | 6 (27.3%) |  |
| Depth of invasion in mm  |  |  |  | 0.129 |
|  ≤4mm | 15 (65.2%) | 7 (35%) | 11 (50%) |  |
|  >4mm | 7 (30.4%) | 12 (60%) | 11 (50%) |  |
| LVSI  |  |  |  | 0.414 |
|  No | 20 (87%) | 19 (95%) | 18 (81.8%) |  |
|  Yes | 1 (4.3%) | - | 3 (13.6%) |  |
|  Unknown | 2 (8.7%) | 1 (5%) | 1 (4.5%) |  |
| Perineural growth  |  |  |  | 0.245 |
|  No | 10 (43.5%) | 12 (60%) | 9 (40.9%) |  |
|  Yes | - | - | 2 (9.1%) |  |
|  Unknown | 13 (56.5%) | 8 (40%) | 11 (50%) |  |
| Positive margin  |  |  |  | 0.371 |
|  No | 23 (100%) | 20 (100%) | 21 (95.5) |  |
|  Yes | - | - | 1 (4.5%) |  |
| HPV genotyping  |  |  |  | - |
|  Type 16 | 19 (82.6%) | - | - |  |
|  Type 18 | 1 (4.3%) | - | - |  |
|  Type 33 | 2 (8.6%) | - | - |  |
|  Type 53 | 1 (4.3%) | - | - |  |
| Treatment modality  |  |  |  | 0.646 |
|  Surgery | 22 (95.7%) | 19 (95%) | 21 (95.5%) |  |
|  Surgery & (chemo)radiotherapy | 1 (4.3%) | 1 (5%) | 1 (4.5%) |  |
| Recurrence  |  |  |  | **0.006** |
|  No | 20 (87%) | 12 (60%) | 9 (40.9%) |  |
|  Yes | 3 (13%) | 8 (40%) | 13 (59.1%) |  |
|  Local (first recurrence) | 3 (100%) | 6 (75%) | 12 (92.3%) |  |
|  Locoregional (first recurrence) | - | 2 (25%) | 1 (7.7%) |  |
|  Distant (first recurrence) | - | - | - |  |
| Time to first recurrence in months (median, range) | 30 (9-42) | 34 (11-103) | 32 (7-125) | 0.794 |
|  Survival status  |  |  |  | **0.014** |
|  Alive | 22 (95.7%) | 14 (70%) | 13 (59.1%) |  |
|  Dead | 1 (4.3%) | 6 (30%) | 9 (40.9%) |  |

**Additional file 2. Patient characteristics of FFPE cohort**

LVSI = lymphovascular space invasion. Significant *p*-values <0.05 by group comparison analysis of categorical data by chi-square test are shown in bold. For non-parametric continuous variables the Mann-Whitney U test was used.