Aim: Clinical and radiological diagnostics are not able to predict nodal or extranodal extension known to negatively impact on disease outcome in oral cavity squamous cell carcinoma (OCSCC). We assessed whether a gene-expression signature from specimens obtained from primary tumour could predict nodal status.

Methods: A series of archival specimens from patients with stage III-IV OCSCC treated with surgery at T and N level as first treatment from 1989 to 2008 was collected. The histological samples were randomly chosen in order to have an equal number of cases with pathological negative nodes (pN0), positive nodes without extracapsular extension (pN + ECS-), and positive nodes with extracapsular extension (pN + ECS+). The histological specimens of primary disease were microdissected in order to obtain one sample from the central area of the tumour (pTcent) and one from the peripheral area (pTperiph). The samples of primary tumour were profiled for gene expression on DASL® Illumina BeadChips.

Results: We present hereafter the results of the first 29 patients in the trial (pN0 = 10; pN + ECS- = 9; pN + ECS + = 10). Gene expression profile resulted in a data matrix containing about 18600 detected genes. We focused our attention on the genes differentially expressed between pN0 and pN+ and between pN + ECS- and pN + ECS+. Imposing a significance threshold of false discovery rate (FDR) <10%, we found patterns of differentially expressed genes in both comparisons. Interestingly, the differences in expression were greater when pTperiph is considered compared to pTcent. The genes up-regulated in pN+ cases mainly involved cell proliferation (BUB3, CDC20, CAMK2D, NEK2, ECT2) and YY1 gene along with genes regulated by this transcription factor. By class comparison between pN + ECS+ and pN + ECS-, one of the most significantly upregulated genes in pN + ECS+ is ITGB1, a well known gene involved in cell-matrix interaction.

Conclusions: The research revealed different gene expression signatures on primary tumour useful to predict nodal status in OCSCC. Mature results of the analysis on a higher number of cases will be presented during the meeting. *Acknowledgment: Italian Ministry of Health call “Ricerca Finalizzata” (Project code: GR-2009-1492184).

Disclosure: All authors have declared no conflicts of interest.