Basosquamous carcinoma: epigenetic considerations in a case

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Basosquamous carcinoma (BsC) simulates basal cell carcinoma (BCC) bringing diagnostic difficulties. This infrequent and destructive tumour accounts for 2% of all non-melanoma skin cancers (NMSCs). Studies disclose the destructive properties of the tumor with an occurrence of distant metastases (almost 7.4%) greater than that of squamous cell carcinoma (SCC) [1]. As far as we know, there are no reported comparisons for epigenetic/ genetic differences between BsC and healthy cells.

A 68-year-old man presented with a tumoral lesion that slowly enlarged for 6 years and a previous shave biopsy report of BCC. Past medical history revealed diabetes and hypertension with no history of sunburn. Dermatological examination revealed a skin coloured tumoral lesion located on the right ala of the nose measuring 4 cm at the longest diameter. The patient underwent surgical resection of the tumour reconstructed with a nasolabial flap. The flap is opened up from outer edges, bearing 3–4 mm of underlying adipose; then, hinged on its bottom, the flap is flipped over medially like a book page. When the flap is sutured to the along defect proximally, the distal flap is graciously rotated 90° angles and its bottom, the flap is flipped over medially like a book page. When the flap is sutured to the along defect proximally, the distal flap is graciously rotated 90° angles and its bottom, the flap is flipped over medially like a book page. When the flap is sutured to the along defect proximally, the distal flap is graciously rotated 90° angles and its bottom, the flap is flipped over medially like a book page.

Expression of actin binding protein fascin differs between some types of skin neoplasia showing infiltrative behaviour of the tumor [4]. Interestingly, we found a massive upregulation of β-actin expression in BsC, normal expression levels in HDF and a very low expres-
Ozge S. Somuncu, H. Mete Aksoy, Basak Mert, Dagcan Bicakci, Demet Akin, Berna Aksoy

Filaggrin 2 has a significant role in epithelial cornification and keratinization [5]. In our research, we found almost no filaggrin 2 expression in BsC cells and the expression was high in healthy HDF and HEK cells (Figure 2 B). Bcl-2 is a family that regulates apoptosis and is responsible for healthy cellular development and prevention of cancer. A higher expression of Bcl-2 was observed in BCC [6]. We found higher expressions of Bcl-2 in BsC when compared with HDF and almost similar expressions when compared with HEKs (Figure 2 C). A lower expression of keratin 15 (CK15) was observed on tumours with high invasion rates. The expression of CK15 is downregulated in SCC, while upregulated in BCC [7]. Our results indicated almost two times higher CK15 expression in BsC when compared with healthy HDF cells (Figure 2 D).

Phosphorylation of Histone 3 serine 10 (p-H3S10) is associated with cell cycle progression. H3 S10 phosphorylation leads to the suppression of transformation and it completely blocks methylation of Histone H3 lysine 9 (H3K9) [8]. H3K9 methylation promotes heterochromatin formation. Acetylation of H3K9 on the other hand, prevents the methylation. Deacetylation is a precondition for heterochromatin formation [8]. In BsC, H3S10 phosphorylation and H3K9 acetylation was found significantly higher than the healthy cells suggesting a lower heterochromatin organization (Figures 2 E, F). It correlates with the recent literature suggesting that cancer cells have hypomethylation and hyper-acetylation of H3K9 promoting heterochromatin instability leading to increased cellular proliferation [9].

Histone H3 lysine 36 (H3K36) acetylation plays a role in transcriptional activation and regulating a double-strand break repair pathway, which is associated with cell death and genomic instability [10]. Our data showed no significant difference but an increment of the expression in BsC and HEKs when compared with HDFs suggesting cancer cells may improve their ability to repair DNA breaks and escape from cell death (Figure 2 G). We also analysed total oxidant status that the cells produce individually. BsC oxidant status was also found almost three times higher than HDFs and greater than that of the standard and HEKs (Figure 2 H).

Our data confirmed the skin related protein expression differences in BsC. We also showed the histone 3 modification alterations in BsC. The interaction of other histone modifications are still yet to be clarified.
Figure 2. A – Massive upregulation of β-actin expression in BsC, in comparison with that in HDF and in HEK cells. B – No filaggrin 2 expression in BsC cells and the expression was high in healthy HDF and HEK cells. C – Higher expression of Bcl-2 in BsC when compared with HDF and almost a similar expression in comparison with HEKs. D – Almost two times higher CK15 expression in BsC when compared with healthy HDF and HEK cells. E – Marked H3S10 phosphorylation in BsC in comparison to the healthy cells. F – Higher H3K9 acetylation in BsC in comparison to the healthy cells. G – No significant difference in H3K36 acetylation but an increment of the expression in BsC when compared with HDFs. H – Oxidant status in BsC is greater than of HDFs, HEKs and the standard.
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Conflict of interest

The authors declare no conflict of interest.

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