

Establishment and Characterization of a Dentigerous Cyst Cell Line

Authors : Muñiz-Lino Marcos Agustín, Vazquez Borbolla Jessica, Licéaga-Escalera Carlos

Abstract : The ectomesenchymal tissues involved in tooth development and their remnants are the origin of different odontogenic lesions, including tumors and cysts of the jaws, with a wide range of clinical behaviors. Dentigerous cyst (DC) represents approximately 20% of all cases of odontogenic cysts, and it has been demonstrated that it can develop benign and malignant odontogenic tumors. DC is characterized by bone destruction of the area surrounding the crown of a tooth which has not erupted and it contains liquid. The treatment of odontogenic tumors and cysts usually involves partial or total removal of the jaw, causing important secondary co-morbidities. However, molecules implicated in DC pathogenesis as well as its development to odontogenic tumors remains unknown. A cellular model may be useful to study these molecules, but that model has not been established yet. Here, we reported the establishment of a cell culture derived from a dentigerous cyst. This cell line was named DeCy-1. In spite of its ectomesenchymal morphology, DeCy-1 cells express epithelial markers such as cytokeratins 5, 6, and 8. Furthermore, these cells express the ODAM protein, which is present in odontogenesis and in dental follicle, indicating that DeCy-1 cells derived from odontogenic epithelium. Analysis by electron microscopy of this cell line showed that it has a high vesicular activity, suggesting that DeCy-1 could secrete molecules that may be involved in DC pathogenesis. Thus, secreted proteins were analyzed by PAGE-SDS, where we observed approximately 11 bands. In addition, the capacity of these secretions to degrade proteins was analyzed by gelatin substrate zymography. A degradation band of about 62 kDa was found in these assays. Western blot assays suggested that the matrix metalloproteinase 2 (MMP-2) is responsible for this protease activity. Thus, our results indicate that the establishment of a cell line derived from DC is a useful in vitro model to study the biology of this odontogenic lesion and its participation in the development of odontogenic tumors.

Keywords : dentigerous cyst, MMP20, cancer, cell culture

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