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### Comparative Immunohistochemical Analysis of p53 and $\alpha$ -SMA in Ameloblastoma, AOT and OKC

*Analyse Immunohistochimique Comparative de p53 et  $\alpha$ -SMA dans l'Améloblastome, l'AOT et l'OKC*

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#### ABSTRACT

**OBJECTIVES:** Ameloblastoma is a benign but highly infiltrative tumour, a behaviour that is lacking in adenomatoid odontogenic tumour but partly shared by the odontogenic keratocyst which possesses a unique intrinsic growth potential with marked ability for destroying bone and a high tendency recurrence. High frequency of stromal myofibroblasts (assessed with alpha smooth muscle actin ( $\alpha$ -SMA) correlates with aggressive behaviour while p53-cell cycle regulation system is critical in odontogenic tumours with immunoreactivity signifying prognostic status. This study aims to determine and compare the immunoreactivity of these selected tumours to p53 and  $\alpha$ -SMA in order to establish if a relationship exists between the frequency and pattern of distribution of myofibroblasts and the behaviour of these lesions.

**MATERIALS AND METHODS:** 69 blocks of ameloblastoma, and 23 each of adenomatoid odontogenic tumor (AOT), and odontogenic keratocyst (OKC/KCOT) were retrieved. Immunohistochemistry technique was applied for evaluation of these two markers staining with primary antibodies to p53 and  $\alpha$ -SMA and the frequency and pattern of distribution of myofibroblasts and immunoreactivity to p53 analysed and compared using ANOVA. p was set at <0.05.

**RESULTS AND CONCLUSION:** Immunoreactivity to p53 and  $\alpha$ -SMA was highest in ameloblastoma (solid compared to unicystic) with highest mean positive cells to  $\alpha$ -SMA (29.7 $\pm$ 20.1) and p53 (28.3 $\pm$ 24.5) in plexiform ameloblastoma. This suggests that ameloblastoma was the most aggressive of tumours studied. Different pharmacological agents that can regulate stromal MF are useful aids to decrease the need for radical surgery in extensive and aggressive odontogenic tumours. **WAJM 2022; 39(3): 248–255.**

**Keywords:** Ameloblastoma, AOT, OKC/KCOT, p53,  $\alpha$ -SMA, myofibroblasts, odontogenic tumours, immunoreactivity.

#### RÉSUMÉ

**ABSTRAIT OBJECTIFS:** L'améloblastome est bénin mais un tumeur mes infiltratif, un comportement qui fait défaut dans la tumeur odontogénique adénomatoïde mais en partie partagé par le kératocyste odontogène qui possède un potentiel de croissance intrinsèque unique avec une capacité marquée de destruction et une récurrence à forte tendance. Haute fréquence de stromalmyofibroblastes (évalués avec de l'actine musculaire alpha lisse ( $\alpha$ -SMA) est en corrélation avec un comportement agressif lors de la régulation du cycle des cellules p53 est essentiel dans les tumeurs odontogènes immunoréactives signifiant le statut pronostique. Cette étude vise à déterminer et comparer l'activité de ces tumeurs sélectionnées à p53 et  $\alpha$ -SMA afin d'établir s'il existe une relation entre la fréquence et schéma de distribution des myofibroblastes et de la comportement de ces lésions.

**MATÉRIAUX ET MÉTHODES:** 69 blocs d'améloblastome, et 23 chacun de tumeur odontogénique adénomatoïde (AOT) et odontogènes des kératocystes (OKC/KCOT) ont été récupérés. Immunohistochimie la technique a été appliquée pour l'évaluation de ces deux marqueurs de coloration avec des anticorps primaires dirigés contre p53 et  $\alpha$ -SMA et la fréquence et schéma de distribution des myofibroblastes et de l'immunoréactivité à p53 analysé et comparé à l'aide de l'ANOVA. p a été fixé à <0,05.

**RÉSULTATS ET CONCLUSION:** Immuno réactivité à p53 et  $\alpha$ -SMA était la plus élevée dans l'améloblastome (solide par rapport à unicystique) avec les cellules moyennes positives les plus élevées à  $\alpha$ -SMA (29,7 $\pm$ 20,1) et p53(28,3 $\pm$ 24,5) dans l'améloblastome plexiforme. Cela suggère que L'améloblastome était la tumeur la plus agressive étudiée. Les agents pharmacologiques différentes peuvent réguler la MF stromale sont des aides utiles pour diminuer le besoin de chirurgie radicale en cas de chirurgie étendue et agressive tumeurs odontogènes. **WAJM 2022; 39(3): 248–255.**

**Mots-clés:** Améloblastome, AOT, OKC/KCOT, p53,  $\alpha$ -SMA, myofibroblastes, tumeurs odontogènes, immunoréactivité.

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**Abbreviations:** AMF/O, Ameloblastic Fibroma; ANOVA, Analysis of Variance; AOT, Adenomatoid Odontogenic Tumour; DC, Dentigerous Cyst; H&E, Haematoxylin and Eosin; KCOT, Keratocystic Odontogenic Tumour; NBCCS, Naevoid Basal Cell Carcinoma Syndrome; OKC, Odontogenic Keratocyst; OKC-O, Orthokeratinised Odontogenic Cyst; OKC-P, Parakeratinised Odontogenic Keratocyst; OOC, Orthokeratinised Odontogenic Cyst; OTs, Odontogenic Tumours; SAM, Solid Ameloblastoma; UCA, Unicystic Ameloblastoma;  $\alpha$ -SMA, Alpha Smooth Muscle Actin.