

Determination of the cause of selected canine urolith formation by advanced analytical methods

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OBJECTIVE: The goal of this study was to determine the cause of selected canine urolith formation using less conventional but more advanced analytical methods.

METHODS: A routine laboratory specialising in urinary calculi analysis noticed a special type of core zone in some canine uroliths, which was typically made up of cylindrical holes. Of 4028 canine samples analysed, non-absorbable suture material was detected in 9 (0.22%) cases. A hollow cylindrical central area was found in a further 13 (0.32%) samples. X-ray microtomography (μ CT) was utilised in order to reveal the channel structure inside this urolith sample. Matrix-assisted laser desorption-ionisation – time of flight mass spectrometry was used in order to assess the cause of this urinary stone formation.

RESULTS: The diameter of the channel structure corresponded with the diameter of the previously utilised suture material and indicated that this urolith was formed around residual suture material. Further confirmation was provided by the comparative matrix-assisted laser desorption-ionisation – time of flight mass spectrometry chemical analysis. This channel structure is formed by a surgical thread that serves as a base for the urolith growth.

CLINICAL SIGNIFICANCE: Results of this study confirm the causative role of absorbable suture material in the pathogenesis of hollow channel structures in some canine compound uroliths.

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INTRODUCTION

Suture-nidus lithogenesis is a well-known form of urolith formation in humans (Matsuda and others 1989), dogs (Appel and others 2008, Ulrich and others 2008), cats (Appel and others

2008) and horses (Ragle 2009). Formerly the phenomenon was observed predominantly following the use of non-absorbable suture material. However, in the last few decades, lithogenic suture material of absorbable origin has frequently been used. Suture material was the most common foreign object detected