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Collaborative activities for academic year 2017-18

MRSA in Gymnasium Community

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Abstract: *The antibiotic resistance of Staphylococcus aureus is increasing worldwide and remains as a potential medical threat. A total of 175 samples were collected randomly from 35 men and women who work out regularly in gymnasium. The samples were collected from sites such as palm, forearm, nose, shoe and towel (n = 175) from each individual. S. aureus were isolated and identified using cultural and biochemical methods and confirmed by coagulase test. Among the 175 samples, 9 isolates (25%) were positive for coagulase tube test. The Antibiotic sensitivity test (AST) for the isolated S. aureus strains were determined by Kirby Bauer method using appropriate antibiotics. The percentage of test cultures which showed resistance to methicillin (30µg), amoxycillin (30µg), penicillin (10 U), bacitracin (10 U), vancomycin (30µg), novobiocin (50 µg) and furazolidone (50 µg) were 86, 71, 71, 57, 57, 57, and 57% respectively. The percentage of methicillin resistant Staphylococcus aureus (MRSA) observed from various screening methods such as oxacillin agar screening test (6mg/l), cefoxitin disc screening test (30 µg), and minimum inhibitory concentration (MIC) - agar dilution method for the S. aureus isolates were 17% (n = 1). The MIC test using different concentration of oxacillin revealed one MRSA strain which had a MIC of ≥ 128 mg/l of oxacillin antibiotic and considered as highly resistant strain. A total of one MRSA strain has been isolated out of 175 samples, though it is not very high but shows the prevalence or contamination of CA-MRSA in gymnasium community. The study shows the importance of disinfection or handwashing before and after exposure to gymnasium since there is a risk factor for MRSA contamination. Further this study indicates Cefoxitin test (30µg) can be used for detection of MRSA.*



CASE REPORT

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Report of occurrence and endodontic management of three-rooted maxillary first and second premolars in the same individual

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Abstract

Anatomical variations should be kept in mind in clinical and carefully looked for in radiographic evaluation during endodontic treatment of maxillary premolars. These teeth have highly variable root canal morphology. Although three separate roots in the maxillary first premolars have been reported, it is a rarity to find both the first and second premolars possessing three separate roots. This case report describes the diagnosis and endodontic management of maxillary first and second premolars with three canals and three separate roots. Access cavity refinements were required for stress-free entry to the complex anatomy.

Comparative Evaluation of Stress developed on Rotary Retreatment Instruments during Retrieval of Gutta-percha

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ABSTRACT

Aim: The aim of the study is to compare the maximum stress distribution on the rotary retreatment instruments within the root canal at cervical, middle, and the apical one-third during retreatment of gutta-percha.

Materials and methods: A human mandibular premolar was scanned, and three-dimensional geometry of the root was reconstructed using finite element analysis (FEA) software package (ANSYS). The basic model was kept unchanged; tooth models were created using the same dimensions and divided into two groups as follows: Group I: ProTaper Universal retreatment system and group II: Mtwo rotary retreatment system. The stress distribution on the surface and within the retreatment files was analyzed numerically in the FEA package (ANSYS).

Results: The FEA analysis revealed that the retreatment instruments received the greatest stress in the cervical third, followed by the apical third and the middle third. The stress generated on the ProTaper Universal retreatment system was less when compared with the Mtwo retreatment files.

Conclusion: The study concludes that the retreatment instruments undergo higher stress in the cervical third region, and further *in vivo* and *in vitro* studies are necessary to evaluate the relationship between instrument designs, stress distribution, residual stresses after use, and the torsional fracture of the retreatment instrument.

Clinical significance: The stress developed on the rotary retreatment instruments during retrieval of gutta-percha makes the instrument to get separated. There is no instrument system, i.e., suitable for all clinical situations and it is important to

understand how the structural characteristics could influence the magnitude of stresses on the instrument to prevent its fracture in use.

Keywords: Finite element analysis, Mtwo retreatment files, ProTaper retreatment files, Retreatment, Stress distribution.

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INTRODUCTION

The success of an endodontic therapy revolves around the quality of instrumentation, disinfection, three-dimensional (3D) obturation of the root canal, and, most importantly, preventing reinfection.¹

Endodontic intervention, despite having a high success rate, may not attain the desired response and failures may occur.² Endodontic failures can be attributed to inadequacies in instrumentation, obturation, iatrogenic events, or reinfection of the root canal system.³

To reduce the risk of endodontic failures during retreatment procedures, it is mandatory to remove as much sealer and gutta-percha as possible to uncover remnants of necrotic tissues or bacteria.⁴ However, very often the gutta-percha is well compacted and offers resistance to instruments, leading to the incomplete removal mostly in the apical third region, further impairing root canal disinfection and reshaping.⁵

Techniques described for gutta-percha removal include the use of endodontic hand files and solvents, heat carrying instruments, ultrasonic tips and files, and rotary instruments. In many clinical situations, combining different techniques may be the most efficient method.⁶

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