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Research Report

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Radiopacity of Several Fiber Posts

Objectives: To determine the radiopacity of several fiber post products.

Introduction: Radiopacity of an esthetic fiber post is important to the extent that it allows the post to be clearly identified on an x-ray when surrounded by tooth, bone tissue and core material. Values of radiopacity are reported in equivalent thicknesses of pure aluminum, which are determined by including a standard aluminum step wedge in the radiograph along with the post. X-ray photographic grey levels of the different thicknesses of the step wedge are compared to the grey level of the post at the level where the post is cylindrical.

Experimental Design

Materials:

RelyX Fiberpost 3D and ***RelyX Fiberpost*** *(3M ESPE)* size #2 (1.6 mm), ***D.T. Light-Post Illusion X-RO*** *(Bisco Dental Products)*, ***LuxaPost*** *(DMG America)*, ***FibreKleer 4x Tapered Fiber Post*** *(Pentron)*, ***FRC Postec Plus*** *(Ivoclar Vivadent, Inc.)*, ***ParaPost Taper LUX*** *(Coltene)*, and ***Rebuilda Post System*** *(VOCO)*

Note: All non-3M ESPE posts were between 1.5 and 1.6 mm in diameter.

Test Conditions:

a. all posts radiographed simultaneously, side-by-side in the same radiograph

b. each post radiographed properly positioned in a bi-cuspid root
(orientation, working distance, exposure time and power held constant for each specimen)(Core material was not used)

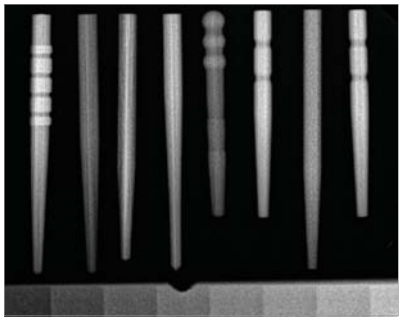
Method:

Type "a" Test Condition: Specimens were radiographed along with a pure aluminum step wedge with a Gendex GX-770 digital x-ray unit set at 70 KVp for 7 seconds. Grey levels of the posts in the x-ray were measured utilizing the Photoshop histogram function and were compared with those of the step wedge to determine an equivalent thickness of aluminum for each post. Values were normalized for post diameter to account for small variations in thickness perpendicular to the plane of the radiograph. Measurements were taken at the major diameter of each post. Means and standard deviations were calculated.

Type "b" Test Condition: The posts were radiographed in a bicuspid root where orientation, working distance, exposure time and power were held constant for each specimen and a composite photograph of all posts created.

Results

Type "a" condition:



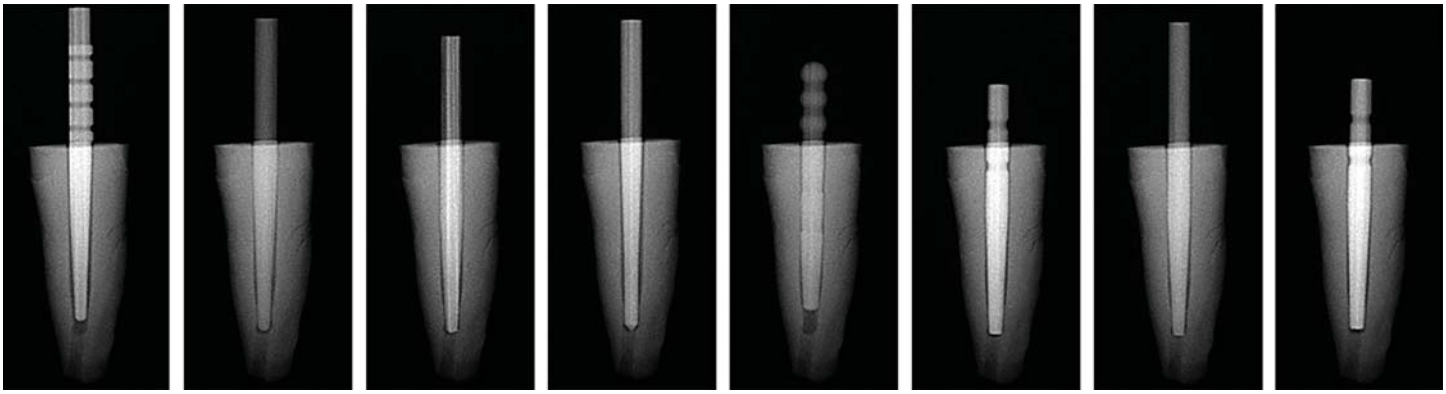
Note: Shown in the order they appear in the chart below.

Radiopacity of Study Posts, mm Al/mm material

Product (from left to right)	Company	Average (SD)
RelyX Fiberpost 3D	3M ESPE	3.5 (0.0)
RelyX Fiberpost	3M ESPE	2.5 (0.0)
Rebuilda Post System	VOCO	3.7 (0.0)
DT Light Illusion X-RO	Bisco Dental Products	3.8 (0.0)
ParaPost Taper LUX	Coltene	2.5 (0.0)
FibreKleer 4X Tapered	Pentron	4.1 (0.0)
FRC Postec Plus	Ivoclar Vivadent, Inc.	3.2 (0.0)
LuxaPost	DMG America	4.1 (0.0)

Results (cont.)

Type “b” condition:



3M ESPE
RelyX Fiberpost 3D

3M ESPE
RelyX Fiberpost

VOCO
Rebilda

Bisco Dental Products
D.T. Light-post Illusion X-RO

Coltene
ParaPost Taper LUX

Pentron
Fibrekleer 4X

Ivoclar Vivadent, Inc.
FRC Postee

DMG America
LuxaPost

Conclusions

The ***FibreKleer 4X Tapered*** *(Pentron)* and ***Luxapost (DMG America)*** posts were the most radiopaque at 4.1 mm Al/mm material. ***RelyX Fiberpost 3D*** *(3M ESPE)*, ***Rebilda Post System*** *(VOCO)* and ***DT Light Illusion XRO*** *(Bisco Dental Products)* were next highest with very similar radiopacity between 3.5 and 3.8 mm Al/mm material. ***RelyX Fiberpost 3D*** was considerably more radiopaque than the ***RelyX Fiberpost***. ***RelyX Fiberpost 3D*** is easily visualized in the composite radiograph of post and tooth root.