

## CASE REPORTS: SYNTHETIC HAIR BRAID EXTENSION ARTIFACTS IN PANORAMIC RADIOGRAPHS

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### ABSTRACT

The authors present two case reports that illustrate synthetic hair braid extension artifacts in panoramic radiographs. They found that hairstyles using synthetic hair braid extensions created radiopaque patterns that varied according to hairstyles. They discuss how these hair extensions may affect panoramic radiographs and the importance of determining whether patients are wearing synthetic hair braid extensions.

Panoramic radiography was invented in 1934. Panoramic radiographs show a more global view of the dental anatomy than the traditional full-mouth series, or FMS, of periapical radiographs and may demonstrate pathology not seen in an FMS. The FMS is the accepted standard with respect to the diagnosis of caries and periodontal disease in adult dental patients. Panoramic radiography, however, has become quite useful for screening large populations and in many dental specialties and subspecialties.<sup>1</sup>

Hair braids are a popular hairstyle in the African-American community. We first noted the radiographic interference of synthetic hair braid extensions in the Emergency Dental Clinic at the Howard University College of Dentistry in February 1996. Since the initial discovery, the faculty of the Department of Oral Diagnosis and Radiography at the Howard University dental school noted approximately 100 cases in which this type of panoramic radiographic artifact is present.

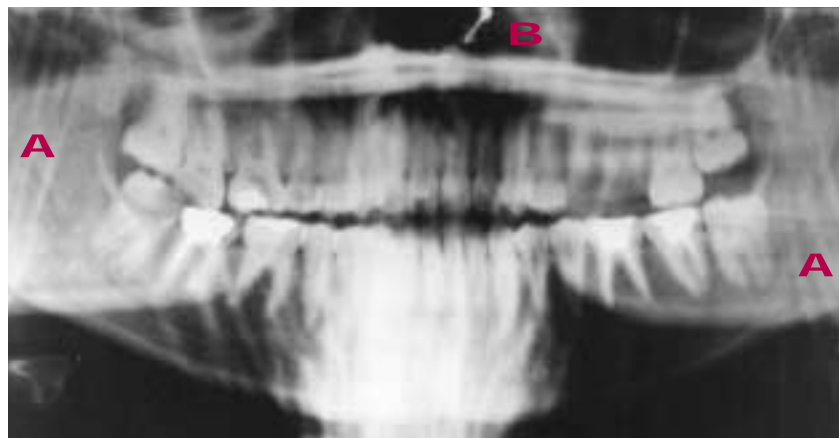
To our knowledge, synthetic hair braid extensions are the only type of synthetic hair extensions that might cause radiopacities, and the radiopaque appearance of synthetic hair braid extensions has not been reported previously. Therefore, we believe it is important for practicing dentists to realize that synthetic hair braid extensions potentially can cause a radiopaque artifactual interference on panoramic radiographs.

The following two case reports illustrate synthetic hair braid extension artifacts found in panoramic radiographs.

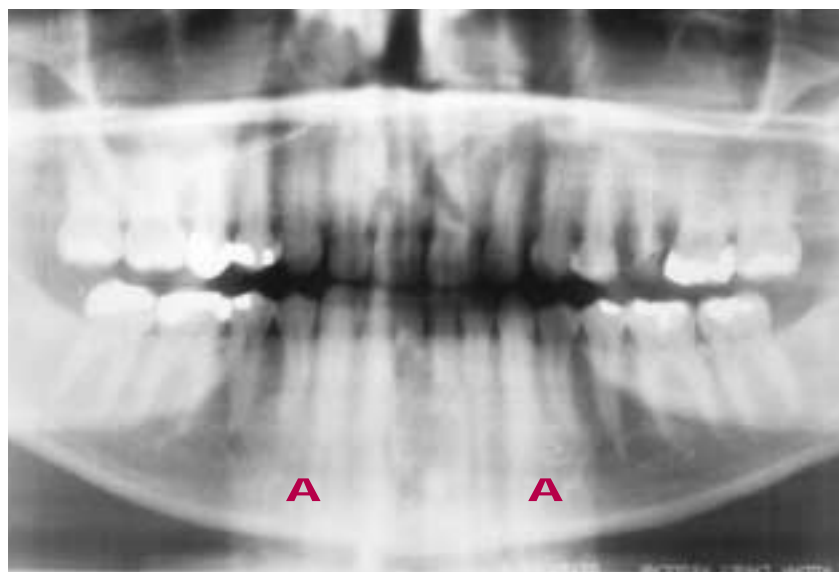
### CASE REPORTS

**Case 1.** A 20-year-old woman reported to the Emergency Dental Clinic at the Howard University College of Dentistry in February 1996 complaining of pain of one week's duration in the posterior maxillary right quadrant. Her medical history showed nothing that would contribute to the condition.

A clinical examination revealed a severe carious infection in the right and left posterior maxillary quadrants and the posterior right mandible. We also found that the maxillary right first molar was sensitive to percussion. We took a periapical radiograph of the max-



**Figure 1.** A panoramic radiograph of the patient in Case 1 shows the synthetic hair braid extension artifacts (A) and the nose ring artifact (B).



**Figure 2.** A panoramic radiograph of the participant in Case 2 shows the synthetic hair braid extensions (A) in the anterior region.

illary right second premolar and right first molar, as well as a panoramic radiograph. These radiographs showed extensive caries and a periapical radiolucency of the maxillary right first molar. We also noted extensive caries on the maxillary right and left second premolars, left first molar and right second molar, and the mandibular right third molar.

In addition, the panoramic radiograph (Figure 1) showed a pattern of radiopacities consistent with the patient's hair-

style. The patient wore her hair with the braids to the anterior of her ears. These radiopacities interfered—to a degree—with the diagnostic quality of the film by masking the radiographic contrast and thus diminishing the diagnostic yield. The patient also had left in place her nose ring during the panoramic exposure. When we asked the patient about her hair braids, she said she wore synthetic hair extensions.

We treated the patient for her emergency dental condi-

tions and informed her of the advantages of definitive dental care.

**Case 2.** One of the authors (T.J.-M.), who was wearing synthetic hair braid extensions, volunteered to be a participant in this evaluation of synthetic hair braid extension artifacts. We took a panoramic radiograph (Figure 2), which revealed an artifactual interference of her hair extensions that essentially was limited to the anterior region and that was more obvious in the mandibular area than in the maxillary area. The participant's posterior maxillary and mandibular quadrants radiographically appeared to be within normal limits. The participant's maxillary left second premolar was in the process of being crowned and was fitted with a temporary acrylic crown at the time the radiograph was taken. We found that the participant's medical history and age were noncontributory and not pertinent to our evaluation.

We also took photographs of the participant (Figures 3 and 4) to show the position of her hair extensions and how we positioned her in the panoramic radiographic unit.

## DISCUSSION

Artifacts appear in many forms of radiology.<sup>1-9</sup> Ghost images caused by hairpins and jewelry are often encountered and are well-documented in panoramic radiography.<sup>1,2</sup> Therefore, we feel that finding a radiopaque pattern secondary to synthetic hair braid extensions is not astounding. Hair and hair artifacts previously have been noted to mimic disease conditions in medical and dental radiology.<sup>1-8</sup> For example, Buccini and Rubin<sup>5</sup> reported a case in

which braided hair mimicked tuberculosis. We found that the radiographic appearance of the braided hair in that case was very similar to the radiographic appearance of the synthetic hair braid extensions shown in our two case reports. As radiopaque interference from natural hair is not expected, it may be that synthetic hair braid extensions were responsible for the radiographic artifact seen on the chest radiograph.

The two cases in this article demonstrate a relative effect. We have noted since February 1996 that some patients' synthetic hair braid extensions cause a very minimal amount of radiopaque interference, as in Case 2, and some cause much more radiopaque interference, as in Case 1. The patient's hairstyle and the degree of radiopacity of the synthetic styling material in the hair extensions apparently influence the amount of radiopaque interference.

We noted that the synthetic hair braid extensions of the participant in Case 2 were positioned behind her ears and that the radiopaque interference was located only in the anterior region on the panoramic radiograph. In Case 1, we also noted greater radiopaque interference with a hairstyle in which the synthetic hair braid extensions were positioned further forward on the patient's face.

As we found that the radiographic appearance of synthetic hair braid extensions varied drastically from case to case, we believe there is a difference in the amount of radiopaque material within various brands of synthetic hair braid extensions. We contacted the distributors of several commercial synthetic

hair braid extension brands to determine the synthetic hair braid extensions' chemical makeups and if a particular radiopaque substance was present. The distributors did not disclose any information regarding the makeup of their products other than that the material was mainly polyvinyl or nylonlike; they stated that further information was proprietary. Neither polyvinyl nor nylon is known to be radiopaque. Therefore, we concluded that there apparently are some un-

known synthetic hair braid extension components that are radiopaque. We currently are evaluating commercial brands to compare their radiographic effects.



**Figure 3.** The participant in Case 2 with synthetic hair braid extensions.



**Figure 4.** The participant in Case 2 in position in the panoramic radiographic unit.

We were surprised by the radiographic appearance of the patient's synthetic hair braid extensions in Case 1; we did not expect the patient's hair to be radiopaque, as observers are not supposed to be able to tell that a person is wearing synthetic hair extensions. The radiographic appearance of the hair extension in Case 1 was one of the most dramatic exhibitions of synthetic hair braid extension artifacts we have found. Several other radiographs we have taken since then, however, have been similar in appearance. In some instances, we retook the panoramic radiograph after increasing kilovolt peak to gain greater penetration, which was necessary to produce a diagnostic radiograph. On some occasions, the bulkiness of the additional hair interfered with the movement of the panoramic radiographic unit and prevented us from taking a panoramic radiograph.

After gaining some familiarity with this phenomenon, we now are able to recognize synthetic hair braid extensions and

ask patients if they wear them before we take the panoramic radiograph. If patients wear synthetic hair braid extensions, we ask them to tie their hair extensions on top of their heads to decrease the image of the synthetic hair braid extension artifact.

#### CONCLUSION

The main purpose of this article is to educate dentists who use panoramic radiography about the possibility that patients' synthetic hair braid extensions may decrease the amount or jeopardize the quality of diagnostic information available from panoramic radiographs. Before taking panoramic radiographs, dentists may need to ask patients with braided hair whether they are wearing synthetic hair braid extensions and, if so, ask them to tie the hair extensions on top of their heads. ■

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1. Razmus TF, Williamson GF, Van Dis ML. Assessment of knowledge of graduating American dental students about the panoramic image. *Oral Surg Oral Med Oral Pathol* 1993;76(3):397-402.
2. Langland OE, Langlais RP, McDavid WD, DelBalso AM, eds. *Panoramic radiology*, 2nd ed. Philadelphia: Lea & Febiger; 1989:245-7.
3. Gold BM. Hair as a mammographic artifact. *Am J Roentgenol* 1992;159(2):430.
4. LaBelle VS, Spock A. Hair artifacts that may simulate disease. *N C Med J* 1992;53(4):170-1.
5. Buccini RV, Rubin II. Radiographic artifact from braided hair mimicking tuberculosis. *N Engl J Med* 1985;313(21):1227-8.
6. Solomon SL, Jost RG, Glazer HS, Sagel SS, Anderson DJ, Molina PL. Artifacts in computed radiography. *Am J Roentgenol* 1991;157(1):181-5.
7. Kessler JR, Wells RG, Sty JR. Skeletal scintigraphy: radiographic artifacts. *Clin Nucl Med* 1992;17(6):511-2.
8. Shanmugasantharam P. Radiographic artifact mimicking root fracture. *Oral Surg Oral Med Oral Pathol* 1993;76(1):131.
9. Reck SF, Fielding AF. Linear radiopacity resembling broken needle. *Oral Surg Oral Med Oral Pathol* 1991;72(6):757-8.