

ENDODONTIC COMPLICATIONS IN AN IRRADIATED PATIENT

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A case report that shows some complications of endodontic therapy in a patient who had been irradiated for nasopharyngeal cancer is presented.

Report of Case

On Nov 12, 1974, a 34-year-old white man reported to the dental service for treatment of a sore mouth. Clinical examination showed numerous large carious lesions, generalized mucositis, xerostomia, and extensive dental plaque. In the area of the mandibular second molar, there was exposed bone and suppuration. The patient had very limited ability to open his mouth.

Radiographic examination disclosed periapical radiolucent areas around the mandibular right first molar, the mandibular left lateral incisor, the mandibular left second molar, and the maxillary right central incisor. An incompletely healed extraction wound was present in the area of the mandibular second molar, along with areas of sclerosing osteitis (Fig 1). Electric pulp tests indicated that the mandibular left first premolar and the maxillary right lateral incisor were pulpless, in addition to the aforementioned teeth with periapical radiolucent areas.

The patient's medical record indicated that he had been treated in another hospital for undifferentiated squamous cell carcinoma of the nasopharynx with cervical metastasis. The treatment was started in April 1960, and consisted of cobalt 60 radiation in the following amounts:

5,950 rads to the oral pharynx, 5,904 rads to the nasopharynx, and 5,490 rads to the cervical area. There was no evidence in the medical record that the dental service was consulted before, during, or after radiation therapy. The patient said that the only dental treatment he had since the cancer was diagnosed consisted of the extraction of a mandibular molar in September 1974. He subsequently developed osteoradionecrosis in the extraction area, which was still present.

Initial treatment consisted of plaque debridement and referral to the oral surgery service for treatment of the osteoradionecrosis. After plaque control was adequate and the necrosis had healed sufficiently so that all exposed bone was covered with mucosa, definitive endodontic treatment was attempted.

Because of the radiation, the muscles of mastication had become

fibrosed and the patient had severe trismus. In the anterior area, he could open his mouth 14 mm from incisal edge to incisal edge, and in the posterior area only 9 mm. The patient said that he had learned to talk and eat with his mouth essentially closed. He was given tongue blades and instructed on their use to slowly pry his mouth open. He also was instructed to massage his muscles and to practice opening his mouth as wide as he could several times a day.¹ The patient expressed a desire to wait several months before endodontic treatment was started so that he could try to open his mouth further. During this time, he did not use the tongue blades but exercised his muscles by opening his mouth maximally 20 times each morning, afternoon, and evening. On March 14, 1975, endodontic treatment was started.

The three anterior teeth were



Fig 1—Radiograph taken Nov 12, 1974, shows multiple periapical lesions and sclerosing osteitis. (Editor's note: In the US Navy Dental Corps, radiographs are customarily viewed from the lingual position.)



Fig 2—Maximum extent that patient could open his mouth after months of facial exercise.

treated first; when he could open his mouth 21 mm in the anterior area and 16 mm in the posterior area, the three posterior teeth were treated (Fig 2). Because the endodontic procedures were very tiring to the patient, several weeks of rest were taken between treatments of different teeth. It was not until Dec 15, 1976, that the final endodontic treatment was completed (Fig 3). Fluoride applicators were constructed and are now in use. Restorative dental treatment has been completed. He will be recalled at six-month intervals for further examination.

Discussion

This case illustrates a frustrating situation that the endodontist may find himself in if a patient is not given a careful dental evaluation before radiation treatment. Oral surgeons did not want to remove the teeth because of the potential for osteoradionecrosis.² The patient had necrotic pulps with periapical pathosis, but he could not open his mouth wide enough for endodontic treatment to be effectively rendered.

Fortunately, this patient cooperated with exercises and eventually was able to open his mouth wide enough for treatment. He refused to try mechanical methods of prying his mouth open, however. In the posterior area, 16



Fig 3—Radiograph taken Dec 15, 1976, shows completed endodontic treatment of six teeth.



Fig 4—Instrumentation performed with hemostat because of limited work space.

mm is not much room to work and the patient could keep his mouth fully opened for only short periods. My forefingers are 9 mm thick; therefore, it was necessary to cut the molar crowns off on the buccal surfaces at the gingivae so enough room could be created to work. Short (21 mm) files were used—the handles cut down—and all instrumentation was done with the files held in the beaks of a hemostat (Fig 4). Because of trismus in this case and the secondary dentin in the pulp chamber and canals, the mesial canals of the mandibular molars were very difficult to instrument.

Mucositis made the patient's mouth very tender; therefore, anesthesia was important. Because the mandible was only partially open, it was difficult to give injections for mandibular block

anesthesia. The hub of the needle was obstructed by the cusps of the premolars; therefore, it was necessary to work through openings in the edentulous molar areas.

Although the radiation treatment had been completed 14 years ago, this patient still had a dry mouth with very mucous saliva. After a rubber dam had been in his mouth for a short time, the patient's throat would get dry and he would cough frequently. I tried moistening his mouth by periodically spraying it with water, but he preferred to use a hand signal and cough when needed. Extreme patience was necessary to tolerate these frequent interruptions.

Figure 5 shows the healing of the necrotic area where the mandibular right second molar had been extracted. It also shows the completed root canal filling of the mandibular right first molar and the sclerotic nature of the surrounding bone. Extraction of this tooth would run a high risk of osteoradionecrosis developing.

In patients with head and neck cancer who will undergo radiation therapy, certain teeth can be maintained. It is important, however, to be selective. Cox³ suggested that all molars should be extracted. A protocol of preradiation evaluation and management of retained teeth is necessary.⁴ Another important consideration in these patients is the irradiation trismus that may occur. This



Fig 5—Radiograph taken Dec 15, 1976, shows sclerotic bone around mandibular right first molar and shows completed root canal filling.

is particularly true if the patients are treated bilaterally in areas involving the muscles of mastication. They should be instructed to do exercises so that they will not lose interarch space.¹ This will not only help the patient eat and talk better, but will be of real value to the endodontist should he have to treat this patient several years later.

Summary

This case report describes complications in endodontic therapy for an irradiated patient. In 1960, the patient received cobalt 60 radiation to his head and neck for treatment of undifferentiated squamous cell carcinoma of the nasopharynx. The muscles of mastication were fibrosed and resulted in severe trismus. After several

months of exercising his jaw muscles, the patient was able to open his mouth sufficiently for endodontic therapy to begin. Mucositis and xerostomia were other complications encountered during treatment.

The opinions and assertions contained herein are those of the author and are not to be construed as official or as reflecting the views of the navy department or the naval service at large.

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