Foley's Footnotes

One of the most readable and enjoyable American diaries is that of George Templeton Strong. Over the years from 1835 to 1875, Strong kept a faithful record of his observations and experiences. The massive four-volume Diary was published by the Macmillan Co. in 1932, under the scholarly direction of Allan Nevins and Milton Thomas. A prominent New Yorker, Strong had varied interests in business, education, and politics, with a special activity in the affairs of the sanitary commission during the Civil War. The Diary contains five diurnal accounts of particular interest to the dentist reader.

On June 29, 1837, Strong wrote of a personal misfortune that dramatizes the home locale as the scene of many dental accidents:

Last evening as I was exercising a little with a pair of dumbbells just before getting into bed and was employing them pugilist-wise, I brought one of them in some strange way in contact with one of my front teeth, and though the shock was a very slight one, it knocked a piece off, leaving both the tooth and gum uneaten, and causing much distress. Any effort to stop the flow of blood and using my front teeth at all, moreover, so much enamel is detached that the tooth will indubitably go, so new for front teeth, dentures, wincers, files, saws, take teeth and such—comfortable prospect. Well, what's done can't be helped.

On Jan 3, 1838, he reports a visit to Columbia to see the Sophomores engage in the popular pastime of inhaling nitrous oxide. "I should have liked to have tried it myself, but I didn't dare to make a fool of myself before half the freshmen and all the Sophomores." On Dec 11, 1844, Horace Wells was to discover the anesthetic property of the "laughing gas" used by the Columbia students as an entertainment device.

On March 5, 1839, Strong recounts a reminiscence about an uncle who had been for many years "a martyr to dyspepsia."

Uncle Thomas arrived from Long Island almost frantic with the agony of that disease. The Hercules that finally vanquished the incubus was a preparation of rather quackish origin, an ointment prepared by rubbing down five gruits of aconite with five drachms of chalk and applying it twice a day on the end of the finger along the track of the diseased nerve and rubbing the surface slightly with it. It cured an immediate cure after one hundred and fifty other expedients had failed. The pain now and then recurs slightly, but a slight application instantly cures it.

In his entry for Nov 26, 1848, Strong reports an attempt to endure a toothache by reflecting, as millions had done before him, upon the philosophy of pain.

Heard a good sermon this morning from Mr. Nightingale and did not hear a good one this afternoon from Dr. Wilmshurst, for I had a toothache in a sensitive molar that nearly drove me out of church. Tried to reflect on and take comfort at Carlyle's "What difference does it make whether I am happy or not?" but couldn't overcome myself or the unpleasantness of the point.

The culturally prominent Strong gives in his notes for Aug 31, 1877 an extraction and therefore the name of the dentist. Dr. Nathan C. Keep is one of the leading figures in American dental history. A charter member of the American Society of Dental Surgeons and the first dean of the Harvard Dental School (1859), Dr. Keep gained a notable place in the records of forensic dentistry by presenting the evidence that led to the conviction of Professor Webster for the murder of Dr. Parkman. He also achieved fame in the field of anesthesia by administering ether to Mrs. Henry W. Longfellow, the first such use in obstetrical cases.

I had two big grinders dug out in three pieces by Dr. Keep while I was under the influence of ether. The operation was so pleasant that I requested to have it repeated.

Gardner R. H. Foley
Surgical repair of tusk injury (pulpectomy) in an adult male forest elephant (Loxodonta africana)

A 15-year-old male forest elephant housed at the Smithsonian Institution's Conservation and Research Center in Washington, DC, sustained a fracture of the right tusk that was 10 cm long and 2 cm wide, exposing the tusk canal. Treatment included surgical debridement, topical application of antibiotics, and administering systemic antibiotic preparations failed, however.

To treat the infected, growing tusks, a root canal comparable to a pulpectomy in man—was performed with successful results.

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In zoological collections where elephants are housed in close quarters, it is not uncommon for tusk injuries to occur as a result of sparring. The injuries usually result in jagged or complete fractures of the tusks that may or may not require attention. This treatment may only entail grinding off sharp edges to reshape the tusk. Occasionally, fractures may occur within the cheek pouch involving the "pulp" of the tusk. Secondary infection of the pulp may necessitate tusk removal. This article describes the prolonged (two years, four months), unsuccessful medical treatment of the elephant tusk in a large earthen or plastic root canal (Rhino Canisor root canal system).
In the absence of the proliferation of granulation tissue overgrowth, but the infected, draining central canal of the tusk remained a problem. Flushing and packing consisted with the use of a variety of antibiotics and antiseptics, but with no improvement. The tusk canal was occluded with non-vital stalactites of dentin (ivory) with a fetid exudate and maggots. The canal was partly cleared by gently removing bits of the devitalized dentin with use of a scalpel, followed again by flushing and packing, but this was unsuccessful. Debridement as well as medical management was performed under trainer control of the elephant.

With the uniform failure of medical treatment and the developing intractability of the elephant, it was decided that a major excavation of the tusk canal was required to salvage the tusk and control the infection. Presurgical preparation con-
sisted of radiographs to determine the extent of the canal (Fig 1), and the exudate was again cultured to determine any change in antibiotic sensitivity. *Pseudomonas* and *Proteus* organisms were again cultured. Chloramphenicol succinate (Chloromycetin) proved to be the only effective agent against both organisms.

• **Anesthesia:** The elephant was given 8 mg of Etorphine (M99) via hand syringe. This dose was inadequate and 50 minutes later an additional 3 mg was injected by projectile dart delivered by a powder-charged rifle.* Immobilization occurred eight minutes after the second injection.

• **Surgery:** Surgical instruments included a variable speed one-half-inch power drill and craniotomy burs to which extension rods had been welded (Fig 2). Steel rods were sharpened and curved to produce a variety of chisels and hoe-shaped curets (Fig 2).

The segment of tusk protruding 17 cm beyond the cheek pouch (Fig 3) was cut off, thus increasing access to the tusk canal. The canal was cleaned of debris and flushed with surgical soap.

The craniotomy bur was used on the power drill to widen and deepen the canal from an initial 1.9- to 3.6-cm diameter and from a 10.5- to 22.5-cm depth. The final depth was established by reaching vital, bleeding, firm tissue. The chisel and hoe-shaped curets were used to remove remaining devitalized ivory within the canal. The cavity was flushed several times using hydrogen peroxide followed by tamed iodine (Betadine) and was packed with iodoform gauze soaked with chloramphenicol. The canal was then sealed with a rubber cork to prevent contamination.

After surgery, the elephant was given 90 ml of long-acting penicillin (Bicillin) intramuscularly. Anesthesia was reversed by the administration of 22 mg of Diprenorphine (M50-50) via the tarsal vein one hour and 15 minutes after immobilization. The elephant was ambulatory and eating five minutes after the injection of the antagonist.
Fig 4 • Radiograph of right tusk 22 months after "pulpectomy" showing surgically widened central canal and uniform density proximally of normally growing dentin.

Postoperatively, only a slight swelling was noted on the right side of the face for two days, but the elephant continued to eat and act normally. Twenty-two months after surgery, the tusk had grown without problems to 14.4 cm and a radiograph was taken (Fig 4). The packing and cork remained in place.

Discussion

The successful outcome of this surgical procedure was the result of a multidisciplinary approach through the collaboration of a dentist and a veterinarian. By viewing the tusk as a large modified tooth, it was possible to formulate an effective surgical treatment. The comparable surgical procedure in humans would be called a pulpectomy. The decision to leave the packing material and cork in place was made because of the previous work, thus demonstrating the ability of the tusk to wall off foreign bodies. These remained within the ivory as inclusions and grew out with the tusk. The postoperative radiograph shows the area of the surgically widened tusk canal with an area of viable dentin posteriorly.

We think that this surgical procedure is indicated in similar tusk injuries, and in retrospect, we think it should have been performed months before.

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*Cap-Chur-Gun, Palmer Chemical and Equipment Co., Douglasville, Ga 30134.
*Nu Gauze, Johnson & Johnson, New Brunswick, NJ 08901.

Accredited dental schools

Commission on Accreditation, Council on Dental Education

Dental schools that have approval, conditional approval, or provisional approval status are listed below. All programs have approval status except those designated with a cross (+) or an asterisk (*). A cross (+) indicates that the program has conditional approval status. An asterisk (*) indicates that the program has provisional approval status. The year following the name of each institution indicates the next regularly scheduled evaluation visit on a seven-year review cycle. It does not preclude the Commission from recommending that an evaluation be conducted prior to the designated year. Information about new programs is included at the end of the list. Definitions of accreditation classifications appear in the addendum to this listing.

Alabama
School of Dentistry, University of Alabama (1979)
1919 Seventh Ave S, Birmingham, 35294
Dean: Dr. Charles A. McCallum, Jr.

California
School of Dentistry, Loma Linda University (1979)
Loma Linda, 92354
Dean: Dr. Judson Klooster

School of Dentistry, University of California at Los Angeles (1981)
Center for the Health Sciences, Los Angeles, 90024
Dean: Dr. Andrew D. Dixon

School of Dentistry, University of Southern California (1977)
925 W 34th St, Los Angeles, 90007
Dean: Dr. Richard C. Oliver

*School of Dentistry, University of California, San Francisco (1982)
San Francisco, 94143
Dean: Dr. Ben W. Povone

School of Dentistry, University of the Pacific (1976)
2155 Webster St, San Francisco, 94115
Dean: Dale F. Redig

Connecticut
+School of Dental Medicine, The University of Connecticut (1978)
Health Center, 263 Farmington Ave, Farmington, 06032
Dean: Dr. Harald Loe

District of Columbia
School of Dentistry, Georgetown University (1982)
3900 Reservoir Rd NW, Washington, 20007
Dean: Dr. Charles B. Murto

College of Dentistry, Howard University (1977)
600 W St NW, Washington, 20001
Dean: Dr. Jeanne C. Sinkford

Florida
College of Dentistry, University of Florida (1976)
J. Hillis Miller Health Center, Gainesville, 32601
Dean: Dr. Don L. Allen

Georgia
School of Dentistry, Emory University (1977)
Atlanta, 30322
Dean: Dr. George H. Moulton

School of Dentistry, Medical College of Georgia (1980)
Augusta, 30904
Dean: Dr. Judson C. Hickey

Illinois
College of Dentistry, University of Illinois (1982)
801 S Paulina St, Chicago, 60612
Dean: Dr. Seymour H. Yale

School of Dental Medicine, Southern Illinois University (1982)
Edwardsville, 62025
Dean: Dr. Stanley P. Hazen

Northwestern University Dental School (1982)
810 E Chicago Ave, Chicago, 60611
Dean: Dr. Norman H. Olsen

School of Dentistry, Loyola University of Chicago (1981)
2160 S First Ave, Maywood, 60153
Dean: Dr. Raffaele Suriano

Indiana
School of Dentistry, Indiana University (1976)
1421 N Michigan St, Indianapolis, 46202
Dean: Dr. Ralph McDonald

Iowa
College of Dentistry, University of Iowa (1980)
Dental Bldg, Iowa City, 52240
Dean: Dr. James H. McLean

Kentucky
College of Dentistry, University of Kentucky (1980)
Medical Center, Lexington, 40506
Dean: Dr. Merrill W. Packer