DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

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It is the object of this department to publish each month original articles on dental and oral radiography. The editors earnestly request the cooperation of the profession and will gladly consider for publication papers on this subject of interest to the dental profession. Articles with illustrations especially solicited.

ROENTGENOGRAMS OF PULPLESS TEETH*

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THERE has been a great deal of criticism recently in dental literature regarding the wholesale extraction of teeth by dentists who have had no special training in the interpretation of dental radiographs and also due to the hasty advice of physicians who hoped the patient would improve as a result of the extractions.

We are daily confronted with patients who present themselves for treatment, and our primary object with every one is to remove infection whether due to unfilled roots or pyorrhea. It is imperative that the patient have a well made set of radiographs of the entire mouth and if any area is doubtful another radiograph should be made at a different angle and it is often surprising to see how differently a condition will appear as the x-ray at best is but a shadow-graph and is never a clear photographic expression of the pathologic condition. Distortions due to varying density of structures and differences due to angles of focus are often responsible for wrong impressions and frequently the x-ray will permit infected areas to pass unnoticed. It is in these unrecognized foci of infection that real danger lies, especially if after the x-ray has shown no appreciable pathological change and the patient is assured that the x-ray shows nothing. When as a matter of fact there may be the foci of infection there, that may be the cause of considerable systemic trouble. So it behooves the roentgen operator to employ every precaution in obtaining radiographs possessing rich detail so that a definite scientific diagnosis may be made.

Too often the size of the area above a pulpless tooth is taken as an indication of the amount of harm that might result which is entirely wrong as the most virulent infections are usually found in the smaller areas. Again an area of in-

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creased transparency instead of meaning that it contains an active infection may contain a granuloma where the old abscessed condition has undergone the process of repair or may still contain infectious matter ready to spring into full activity upon the slightest irritation.

Schuhmann has recently stated that other sinus shadows over teeth are due to the fact that in the process of devitalizing and treating teeth many times drugs are employed which act as strong escharotics and the result may be a coagulation of lymphoid matter over the root end which will appear as a darkened shadow over the apex of the tooth. So exercising all the care and skill an individual can in the passing of judgment on dental radiographs he will still make a few mistakes but when in doubt always let the old slogan "safety first" be your guide and extract. I also feel that no one is justified in passing judgment on a set of radiographs without seeing the patient or at least having a full history of the case and more definite results will be obtained if radiographs are studied while examining the mouth, also having thorough knowledge of the patient's general systemic condition.

No matter how well a root may be treated and filled there is still an element of doubt as to whether or not there may be some hidden infection there and Rosenow makes the statement that every devitalized tooth has an area of lowered resistance about the root end and should be considered unsafe.

Beginning or inflammatory changes of bone infection are not discernible in the radiograph as it does not at once produce gross bony liquefaction. After several days or weeks there is sufficient decalcification for recognition: so when an area is found over an apex it is hard to determine the length of time infection may have been present.

In the face of these facts in order to insure safety for our patients it is necessary to continue with extractions but instead of being condemned hastily as in the past we now feel inclined to weigh carefully the radiographic and clinical findings and take into consideration the personal equation and when we conscientiously exercise these precautions no unnecessary extractions will be done as the medical profession are now leaving these serious questions to the dentist who has an understanding of roentgenographic pathology.

It is not my purpose in this short paper to attempt to discuss all that would come within the scope of this field but to limit myself to these three phases, namely:

1. Indications for the extraction of teeth.
2. Indications for treatment.
3. Indications for keeping under observation.

In the first classification I will mention a few conditions in which we find pulpless teeth that we can with impunity remove. All pulpless teeth which are not necessary for cosmetic reasons and of no use in mastication should be extracted. In this class will be mostly third molars around which will also be found pockets harboring bacteria due to the fact that there is usually not enough space to completely erupt and the tissue overlies the enamel surface but can not attach. All teeth which show a definite area of infection on a patient who is beginning to show evidence of the absorption of toxins should be relieved of these infected areas as it is nothing short of criminal to allow them to remain and as a consequence have a heart lesion or an impaired joint.

All pulpless teeth over which there is a cyst, removal is usually necessary and also the entire cystic membrane to prevent too great a loss of bone due to the continuous pressure of the cyst wall on adjacent structure and often becoming secondarily infected, causing a great deal of trouble.

Teeth which have been treated and the walls of the canals perforated, the usual result being an alveolar abscess, should be removed.

In the process of treating teeth one often encounters a condition where it is impossible to gain access to the infected area through the root canal, due perhaps to the fact that a phalanx of cement has been forced into the canals which can not be removed, also broken broaches are often met with high in the root which can not be taken out, so the tooth should be extracted.

Any tooth where the pulp dies before the roots have attained their full growth, leaving a wide open root end, invariably are seriously infected and should be taken out.

Impacted teeth under most conditions should be extracted but I will not go into this subject as it is too lengthy for consideration here.

Teeth infected from pyorrhea where the radiograph shows the bone structure gone to any extent should be taken out but this is a subject in itself and worthy of a paper on that alone.

Under the heading of teeth to be retreated, I will mention just a few conditions where this can be safely done.

Moorehead says that less than ten per cent of dentists are able to do reliable root canal work due to lack of technique and proper training in so highly a specialized operation requiring a knowledge of medicine plus aseptic surroundings and a great perseverance, requirements which are possessed by only a few.

Teeth which have only an indefinite area about the root end where the canals can be opened may be treated and filled but the x-ray should be used to show the work properly done and another radiograph taken about a year later to see that no further trouble has developed. In patients who are in the best of health one may attempt treatment in teeth showing large areas but often in these conditions the root ends are roughened and to insure freedom from reinfection a root resection should be performed which is usually successful if well done.

In the classification of pulpless teeth to be kept under observation I have many in mind where the root end is very small and the canals may not be properly filled and where there is no evidence of infection over the apex, and the tooth perfectly comfortable. If these teeth are opened and treated and the root end enlarged it is subject both to hemolytic infections, and infection introduced from without, and better left untouched. These teeth should however be radiographed a year or so later and if still in the same apparently safe condition will beyond doubt remain so indefinitely. In this class the upper bicuspid are the most frequent.

In the darkness and doubt of infections of pulpless teeth and the demand for "more light" we find our only solution in the prevention of these conditions is to avoid the initial introduction of caries in tooth structure and this can be done by strict prophylaxis. Dentistry in the past fifty years has made wonderful strides and the men responsible for this progress are worthy of highest praise. In the past, however, nearly every effort has been to repair lost tooth structure

with but little thought being given to prevention. In the new era upon which we are entering, when prophylaxis will be practised and preached, we will have mouths where every tooth is highly polished instead of broken down and infected. At least 90 per cent of decay and 95 per cent or even more of the dead pulps will be prevented and the patient have teeth beautiful to look at, as well as representing the maximum in masticating efficiency, and comfort, with absolute freedom from pyorrhea and gingivitis. This Utopian period in dentistry is bound to come as it is the very essence of common sense, but will come much sooner with the earnest cooperation of the medical profession.

A DISCUSSION OF WHAT HAPPENS IN A ROENTGEN TUBE*

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IN order to form a conception of what happens within a roentgen tube, one must understand something of the nature of matter and especially those elements of matter entering into the construction of a roentgen tube, as well as electricity.

In this paper, I propose to discuss briefly and as far as possible separately:

1. The Anode or Anti-Cathode
2. The Cathode
3. The Electrical Discharge
4. The Cathode Ray
5. The Roentgen Ray

My discussion of the roentgen ray will be very brief in this paper and will be concerned only with what seems to be the most useful theory of its production at the anode.

The kind of tube upon which I wish to base my remarks principally is the hot cathode or coolidge tube. In this connection, I wish to say that in my judgment, we as roentgenologists owe our greatest debt of gratitude to Dr. W. D. Coolidge, excepting only W. C. Roentgen, the discoverer of the rays themselves.

The Coolidge tube as it stands to-day marks the greatest step in advance in the science of roentgenology since Roentgen discovered the rays.

Aided by such co-workers as Hull, Davey, Moore and others, Dr. Coolidge through the experimental laboratories of the General Electric Company continues to be our most potent and productive source of scientific achievement for roentgenology.

The coolidge tube is superior in almost every respect to any other form of roentgen tube.

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