EMERGENCIES IN GENERAL PRACTICE DENTISTRY FOR THE SHIP SURGEON

BY

E. JOSEPH, F.D.S.

This article is written for those about to become ship surgeons, as they may quite often be called upon to deal with dental conditions. A few sessions in a dental outpatient clinic, however, will be of greater value to them than all the articles which can be written, and the prospective ship surgeon is urged to spare the time for this, if he can.

Equipment

The relief of dental pain can be effected with a few inexpensive instruments and drugs. In most ships which carry a doctor a set of dental instruments and drugs are provided. These should be checked for the following items: a dental mirror and probe, a pair of tweezers, excavators and filling instruments, a hypodermic syringe (preferably cartridge-type), and extracting forceps. The drugs should include zinc oxide powder, oil of cloves, 2% procaine or lignocaine solution, 1 in 1,000 adrenaline hydrochloride solution, absorbable haemostatic gauze, and codeine tablets. Armed with these the surgeon is able to deal with the usual dental conditions that arise during a voyage, such as toothache, swollen faces, persistent haemorrhage after an extraction, erupting wisdom teeth, and Vincent's stomatitis.

Toothache

If the patient points with certainty to one particular tooth, it is fairly certain that this is the source of the pain. Often, however, the pain cannot be localized so accurately and the patient points vaguely to the upper or lower facial region, or, more disconcertingly, spreads his hand over the whole of one side of his face. This is where a short history is of value before the mouth is examined. Transient pain associated with hot, cold, or sweet foods often signifies exposed dentine, either in a cavity or around the necks of the teeth. Test for cavities in the teeth with the probe and look for areas where the gingivae have receded from the necks of the teeth. Run the probe gently over them to see if they are sensitive.

If the patient complains of a continuous dull ache or a throbbing pain, look for cavities in the teeth and redness and swelling in the buccal sulcus or on the palatal and lingual aspects of the alveolus, where an alveolar abscess may be pointing. If this inspection does not yield a diagnosis, percuss the teeth individually to see if any are painful, or loose. In some cases the pain is accentuated and located more readily after the patient has rinsed his mouth with hot or cold water.

Remember that the pain from acute sinusitis can resemble pain of dental origin. A helpful diagnostic point in such a case is sensitivity to percussion of several upper teeth without any obvious dental cause. Sometimes also the patient complains of a throbbing pain when the head is bent forwards.

Pain from caries can often be relieved by excavating the carious dentine and filling the cavity with a mixture of zinc oxide and oil of cloves. Should the cavity be large, however, or the tooth tender on percussion, or should a swelling have developed, the tooth is usually impossible to save by routine methods and should be extracted.

Swollen Faces

An alveolar abscess, like any other acute abscess, tends to point along the line of least resistance, which is, of course, governed by the local anatomy. If the origin of the abscess

is above the attachment of the buccinator to the upper jaw or below the attachment of this muscle to the lower jaw the inflammatory process spreads into the tissues of the cheek and causes a swollen face. Should the reverse occur a "gumboil" will be seen in the mouth.

If the inflammatory process spreads into the cheek it is relatively harmless, but should it involve other regions and be accompanied by severe constitutional symptoms immediate treatment is necessary. Abscesses from upper teeth occasionally spread towards the inner canthus of the eye. If a thrombophlebitis should occur in the veins around the orbit (when orbital cellulitis will be evident and the soft tissues in that region will be tender on palpation), a cavernous sinus thrombosis may follow. Abscesses from lower teeth can spread to involve the floor of the mouth and the tissue spaces of the neck, giving rise to Ludwig's angina.

If the inflammation is invading either the orbit or the neck, extraction of the tooth should be delayed for fear of spreading the infection further. An adequate course of some suitable antibiotic should be started immediately—for example, 500,000 units of sodium penicillin twice a day, until the condition is controlled. If pus has localized it should be released, preferably by an intra-oral incision. In the absence of facilities for giving the patient general anaesthesia most acute alveolar abscesses can be treated initially in this way. Once the inflammatory process has resolved and the swelling has subsided, the tooth can safely be extracted under local analgesia.

Anaesthesia for Dental Extractions

If extraction of the tooth is the only immediate method of relieving pain, and the operation is not likely to spread infection, the choice of anaesthetic is the next consideration. If facilities for giving a general anaesthetic are not available, local analgesia must be used.

All teeth except the mandibular molars can be anaesthetized by injecting 1-2 ml. of local analgesic solution (preferably 2% lignocaine) around the buccal and lingual sides of the root. The mandibular molars should be anaesthetized by an inferior dental regional block injection, but if the operator is unfamiliar with this procedure 1-2 ml. of lignocaine on the lingual and 3-4 ml. on the buccal side of the tooth will often prove to be effective after about twenty minutes.

When injecting on the buccal side of a tooth, remember to pierce the mucosa at its reflection from the gum (mucobuccal fold) and to advance the needle until its tip is judged to lie over the apex of the root (Fig. 1). After waiting for about five minutes, test for anaesthesia by prodding the gum on either side of the tooth. If it is painful inject more solution.

FIG. 1.—Injection of local analgesic on the buccal aspect of a tooth. A, alveolar bone surrounding the root. X, needle piercing the mucobuccal fold. O, tip of the needle.

Technique of Extraction

Teeth, like icebergs, have more beneath the surface than meets the eye. Furthermore, caries often weakens a crown more than is clinically apparent. Therefore, when extracting a tooth, never grip it by the crown. The forceps should engage the superficial part of the root. For this reason the blades of extracting forceps have sharp edges and are designed so that they can be forced a certain distance down the periodontal membrane between tooth and bone.

The general design of extracting forceps, which is governed by the access available in the various regions of the mouth, is such that the forceps can grip the tooth and the tooth be moved. Thus, whereas the upper incisors and canines are extracted with straight forceps, the handles of forceps used on upper teeth further back in the mouth are cranked to varying degrees in order to avoid obstruction against the lower teeth (see Fig. 2). Similarly, in order to

FIG. 2.—Forceps for extracting upper teeth.

FIG. 3.—Forceps for extracting lower teeth.

allow the operator to work in a suitable position, the blades of forceps used for extracting the lower teeth are set in a plane at right angles to their handles (see Fig. 3).

When extracting teeth in the lower right quadrant of the mouth, the operator should stand behind and to the right side of the patient. Teeth in other segments of the mouth should be extracted with the operator standing in front of the patient. The operator's left hand should grasp the tooth between forefinger and thumb. These fingers act as a guide and prevent the forceps from slipping during their application. They also provide information about movement of the tooth.

Extraction movements not only sever the tooth from its attachment, but often distort or even fracture the surrounding bone before a tooth with curved or multiple roots is released. An intermittent force of gradually increasing magnitude applied in the correct direction is more likely to release a tooth without fracturing its root than a force of great magnitude which is suddenly applied. For this reason the tooth should be "worked" in the correct direction with force which is gradually increased as the operator feels the supporting structures giving way.

Extraction of Individual Teeth

Numerous techniques for extracting the individual teeth have been described. The methods described here are

simple to follow and will give good results in the hands of less experienced persons.

Upper Central and Lateral Incisors.—The roots of these teeth are single and roughly circular in cross-section. They should therefore be rotated about their longitudinal axis in order to sever their attachments, and then drawn vertically downwards in order to extract them. Use upper straight forceps.

Upper Canines.—These teeth also have single roots, but they are often triangular in cross-section and resist rotation. If this is the case they should be cautiously loosened in a buccal direction and drawn vertically downwards. Remember that these are the teeth with the longest roots in the mouth. Use a heavy pair of straight forceps.

Upper Premolars.—The first upper premolar often has two roots and requires particular care during extraction. The second upper premolar usually has only one root. The alveolus surrounding these teeth is thinnest on its buccal aspect. They should therefore be loosened in a buccal direction with rocking movements, and drawn downwards at the same time. Use a moderately cranked pair of upper forceps.

Upper Molars.—The first and second upper molars usually have three roots. In the upper third molar the roots are usually fused. The same method of extraction applies as used for premolars. Use a well-cranked pair of upper forceps.

Lower Central and Lateral Incisors.—The roots of these teeth are thin and triangular in cross-section, and the alveolus is weakest on its buccal aspect. These teeth are therefore extracted in a buccal direction. Use lower forceps with narrow blades.

Lower Canines.—The roots of these teeth, like those of upper canines, are often triangular in cross-section. Often, however, it is possible to rotate them. If not, they should be gently eased in a buccal direction. Use lower forceps with medium blades.

Lower Premolars.—The roots of lower premolars are usually circular in cross-section and the teeth can be loosened by a rotation about their longitudinal axis and then removed vertically. Use lower forceps with medium blades.

Lower First and Second Molars.—These teeth usually have two roots. They are loosened by rocking in a buccolingual direction before removing buccally. Use lower forceps with wide blades.

Lower Third Molars ("Wisdom Teeth").—Several books have been written on the extraction of lower third molars and it is only possible to give a general guide here. If these teeth have fully erupted, treat them like first and second molars. If they are impacted, extraction should be deferred. Their treatment is described below under the heading "Lower Wisdom Teeth."

Post-operative Treatment : Persistent Haemorrhage

When the tooth has been extracted the socket should be squeezed together with finger pressure, and the patient should be allowed to rinse his mouth out once or twice. He should then be made to bite firmly for ten minutes upon a pad of gauze placed over the socket, and should not be discharged until a firm blood clot has filled the socket. This treatment should suffice for most cases and the patient should complain of no more than soreness of his gum on the next day.

Should the socket become infected, however—which it may from a variety of causes—the patient will complain of a continuous dull ache four or five days after extraction. On examination it will be seen that the blood clot has broken down and pus will be present in the socket. Treatment should consist of syringing the socket daily with hot "eusel" or hydrogen peroxide, followed by the insertion of a loose dressing of cotton-wool soaked in oil of cloves. The patient should wash his mouth out with hot saline solution as often as possible.

Persistent haemorrhage may be due to a traumatic extraction or simply represent a reactionary haemorrhage

consequent upon an increase in blood pressure. The first thing to do is to locate the area where the haemorrhage is occurring. If a large blood clot obstructs the view, remove it with a piece of gauze. Then, while swabbing the socket with some dry cotton-wool, try to identify the exact bleeding points. These are often in the gum surrounding the socket, but occasionally they will be found in the depths of the socket. It is then possible to assess whether the bleeding is arterial, venous, or capillary in nature, and whether there is an abnormality in the clotting mechanism of the blood. Obviously, if clots can be seen in other sockets, the fault does not lie in the clotting mechanism of the blood.

Pressure is still the cheapest and best method of arresting haemorrhage, and position and rest still play their parts. Place a rolled-up swab directly over the socket and get the patient to bite firmly upon it for fifteen minutes. If this is not effective in capillary haemorrhage, dip the swab in 1 in 1,000 solution of adrenaline hydrochloride and apply similar pressure. Astringents such as tannic acid and alum can be placed on the swab. They act by precipitating the proteins in the tissues and vessels.

The various preparations of absorbable haemostatic gauze are very effective if introduced into a socket, but the practice of plugging a socket with unabsorbable gauze should be avoided because it delays healing and often leads to subsequent infection. A blood clot is the most desirable thing to have in a socket.

Lower Wisdom Teeth

These teeth are often responsible for swollen faces and trismus in young adults. If this is suspected to be the case, look for inflammation around an erupting third molar and palpate for tenderness in that region. The pain is seldom due to caries. As it erupts, the lower third molar pushes up a flap of gum distally. Should the eruption of this tooth become impaired by impaction, an area of stagnation remains beneath this flap of gum and it readily becomes infected. The submandibular and upper deep cervical lymph nodes are usually enlarged and tender. The constitutional symptoms should be assessed, because spread of infection from this region can have serious consequences. If the infection spreads into the cheek it is relatively harmless, whereas if it should spread to the submandibular and sublingual spaces (in which case the floor of the mouth will be felt to be turgid and be painful on palpation) Ludwig's angina may result. The infection may also spread via the lateral pharyngeal space to cause a cellulitis of the neck and oedema of the glottis.

The treatment of an erupting lower third molar seldom consists in immediate extraction of this tooth. The upper third molar is often found to be biting upon the gum flap. In such a case if this upper tooth is extracted considerable relief will be obtained. The inflammation should be treated with hot mouth-washes, and antibiotics if the severity of the condition warrants their use. When the inflammation and pain have subsided the extraction of the tooth should be delayed until a dental surgeon is available to do it.

Vincent's Stomatitis

Most cases of bleeding gums have a simple aetiology, such as poor oral hygiene or calculus around the teeth, and can be controlled with hydrogen peroxide mouth-washes until a dental surgeon is able to perform specialized treatment. Vincent's stomatitis, however, requires immediate treatment. The patient complains of bleeding gums, severe local pain, and general malaise. Early cases will show all the signs of acute inflammation. The papillae of gum between the teeth soon become replaced by saucerized necrotic yellowish ulcers which bleed upon the slightest provocation. These ulcers subsequently coalesce to form the classical "ribbon ulcer" around the necks of the teeth. By this time, however, the smell is diagnostic and the mouth need hardly be examined. Penicillin lozenges or chewing-gum should be given for two or three days. This should

be followed by hydrogen peroxide mouth-washes until the acute phase has passed. In order to prevent a recurrence of the disease the patient should see a dental surgeon as soon as he is able to do so.

Fractures of the Jaws

On certain occasions, such as after the crew has been ashore in a foreign port, a ship's surgeon may be called upon to diagnose and treat fractures of the jaws. Diagnosis can be made easy by remembering the classical signs and symptoms of fracture of any bone and relating them to the particular circumstances of the jaws. Pain upon movement, trismus due to muscle spasm, and malalignment of the teeth are the most striking results of such fractures. Those cases which are not apparent upon examination are usually the ones which require no treatment anyway.

If the mucosa is torn, or a haematoma can be seen in the mouth, antibiotic therapy should be instituted to prevent the fracture line from becoming infected. Infection is particularly likely following fractures of the mandible, and can complicate and prolong treatment by many months. Loss of function interferes with physiological cleansing of the mouth, and when debris collects on the tongue and teeth it rapidly gives rise to a condition known as "foul mouth." Patients should be encouraged to keep their mouths clean by using a soft toothbrush wherever possible, and should use alternate mouth-washes of sodium bicarbonate and hydrogen peroxide frequently, in order to remove debris.

Reduction of the displacement is rather a specialized procedure. Under normal conditions, and with a good set of natural teeth, very little displacement can be tolerated. This is because malalignment of the teeth greatly impairs function. When such cases occur aboard ship—even if there are facilities for giving a general anaesthetic—the means of immobilizing the reduced fracture, such as by splinting and wiring the teeth, are not available. These fractures must therefore be reduced as well as possible by manipulation under local analgesia and morphine. When the patient finally receives specialized maxillo-facial treatment, malunited fragments may need to be refractured and repositioned in order to produce a good functional result. It may, however, only be necessary to grind or extract a few teeth in order to produce this.

If the patient is edentulous or has only a few teeth left, a fair amount of displacement can be allowed. This is because dentures can later be made to compensate for malalignment of the fragments.

To achieve immobilization of a fractured jaw in the absence of specialized knowledge and equipment, resort must be had to simple though less effective measures. A head bandage of webbing or calico which goes under the chin and is attached to a circular band around the forehead and occiput is preferable to the classical "four-tailed" bandage, which is likely to displace a fragment posteriorly. It is also superior to the barrel bandage, which quickly stretches and loosens. A wide strip of adhesive plaster can be placed from chin to vertex. Edentulous patients should be immobilized with their dentures in position so that these act as a splint. Some anterior teeth can be filed off a denture to allow a space for feeding. Simple fractures should be immobilized for four to six weeks.

A patient will need about 3,000 calories a day. These must be provided in a form which does not involve chewing. Patients with missing teeth can feed themselves through the spaces with a spoon or a rubber tube from a feeding cup. In the absence of such spaces it will be found that there is room enough behind the last molar tooth for feeding purposes.

Next article on Emergencies in General Practice.—
"Severe Earache," by Mr. C. Gill-Carey.