Dental Treatment of Handicapped Patients Using Endotracheal Anesthesia

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Dental treatment using endotracheal anesthesia is indicated where acute odontogenic infections, accidental injuries, or multiple caries and periodontitis marginalis require surgical and/or restorative treatment. It is also indicated where it is not possible to use psychological support during local anesthesia or during premedication or analgosedation. Dental treatment of handicapped patients using endotracheal anesthesia is described, along with indication and frequency of such treatment. The state of the dentition is illustrated, along with its relationship to the oral hygiene the handicapped patients receive. The main points of the intraoperative dental procedures and the follow-up of patient care are reported. Postoperative dental or general medical complications have not occured within the patient population under study.

Key Words: Handicapped patients; Endotracheal anesthesia; Dental treatment.

Endotracheal anesthesia is indicated if it is not possible to carry out extensive restoration due to the patient's inability or, particularly in the case of small children, unwillingness to be treated during local anesthesia.[1-7] Patients with accidental injuries or extensive odontogenic infections may in some cases also require treatment using general anesthesia.[8] For less extensive treatment, premedication or analgosedation may be used as alternatives to dental treatment using endotracheal anesthesia.[2,9-12]

DENTAL TREATMENT IN ENDOTRACHEAL ANESTHESIA

An anesthetist from the Center for Anesthesiology and Intensive Medicine is available once a week for carrying out dental treatment requiring endotracheal anesthesia in the Department for Oral Surgery and Dentistry at the University Center for Dental, Oral and Maxillomandibular Medicine. During the past 23 years, 1210 patients, mainly patients who are handicapped, were treated in this way. The number of patients treated per year has varied between 29 and 86 (Figure 1).

From January 1992 until now, background and clinical parameters of 320 patients were documented in detail. For half of the study population, this was their first dental treatment using endotracheal anesthesia; for 30%, this was a second visit. Some patients had undergone dental treatment using endotracheal anesthesia for up to eight times.

The primary age group of treated patients was between the ages of 26 and 30, followed by patients between the ages of 6 and 15. By comparison, patients over 30 were rarely treated (Figure 2).

About one-third of the patients had been mentally handicapped from birth, the cause of which could not be clarified by history. Concrete causes for about 11% of the disablement originated in perinatal hypoxia, 8% in autism, and 2% in Down's Syndrome. In approximately 16% of our patients, the mental handicap was associated with epilepsy. For about 15% of the handicapped, it was not possible to obtain further information on the cause or the time of the emergence of their handicap. The category "psychosis" summarizes all patients who did not undergo dental treatment due to a phobic fear of classical dental treatment, even when they were administered pretreatment medication. The

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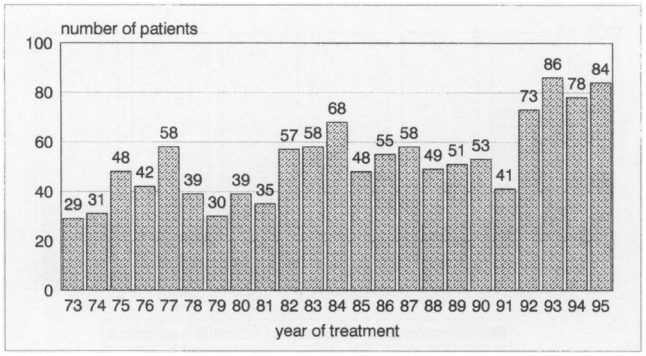

Figure 1. Number of patients treated with endotracheal anesthesia.

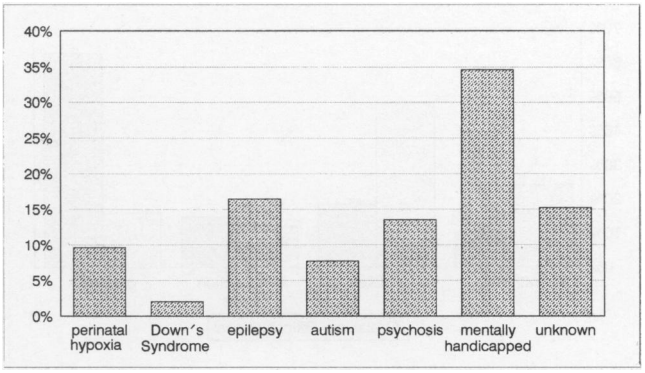

Figure 3. Types of disablement of patients treated with endotracheal anesthesia.

majority of these patients were children up to the age of 10 (Figure 3).

On the occasion of the primary examination of patients in the department, an inspection of the oral cavity could not be carried out in about 56% of the cases; in approximately 70% of the cases, it was not possible to take an orthopantomographic x-ray that could be evaluated, or any other x-ray films. More than half of the patient population was presented to us with signs and symptoms of pain.

One-half of the patients were cared for at home by relatives; the other half lived in institutional homes. According to the individuals caring for the patients, regular dental hygiene was possible in about one-third of the patients. In another third of the patients, occasional oral hygiene procedures could be carried out, and in the remaining third of the patients dental care was not possible. The seriously compromised dentition in patients from institutions, with whom regular oral hygiene had been practiced rarely, was especially noticeable when compared to patients who received regular daily oral hygiene from relatives (Figure 4).

We have carried out, and are continuing to carry out, thorough oral examinations on anesthetized patients. Only 15% of the total of examined patients were without any hard dental calculus; 31% showed isolated dental calculus, 15% in the predilection areas. In 39%, dental plaque was generally present in quantity. As expected, the patients living in institutional homes presented the highest proportion of the latter group, whereas two-thirds of the handicapped patients living at home could be allotted to the first two groups (Figure 5).

With reference to therapy, apart from dental prophylaxis, the extraction of an average of four teeth per intervention prevailed. About 5% had to be extracted surgically. An average of about three teeth per intervention were restored by conservative therapy. Although the number of teeth requiring treatment was lower in the case of patients living in institutional homes than in the case of those patients living at home, the extraction of teeth was clearly indicated more often in the institutionalized patients. Disabled patients who were cared for by relatives were more often treated in a way allowing tooth conservation (Figure 6).

On average, about seven teeth per patient were treated. However, in isolated cases, considerable deviations from the mean were found. For example, dental prophylaxis was all that was required in three patients,

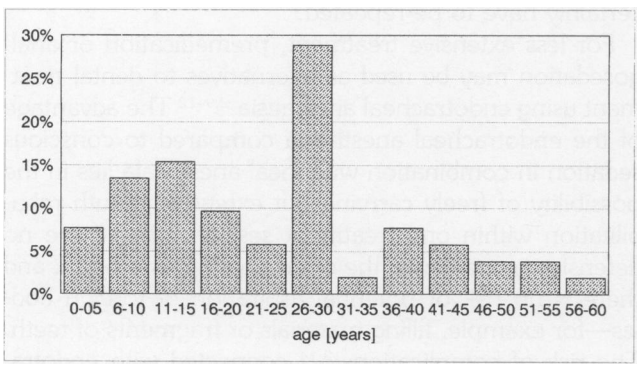

Figure 2. Age of patients treated with endotracheal anesthesia.

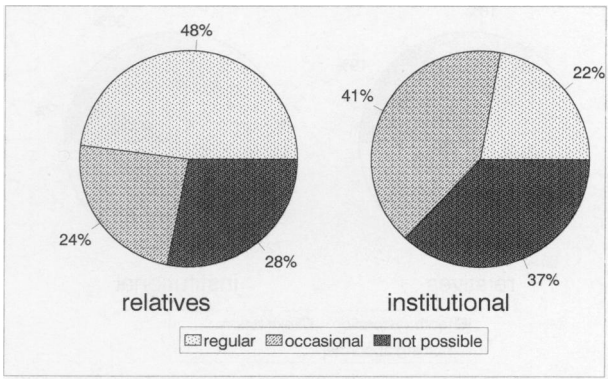

Figure 4. Possibility of performing dental hygiene in handicapped patients.

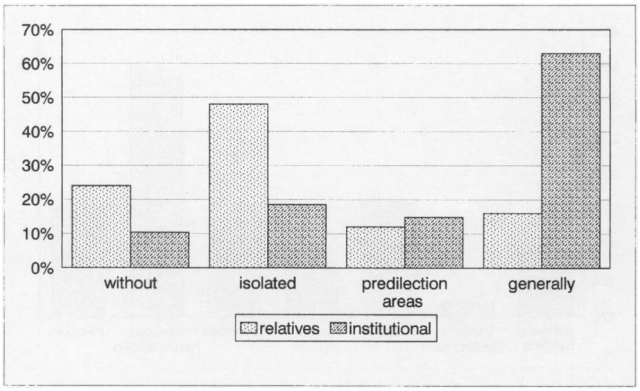

Figure 5. Prevalence of dental calculus in patients treated with endotracheal anesthesia.

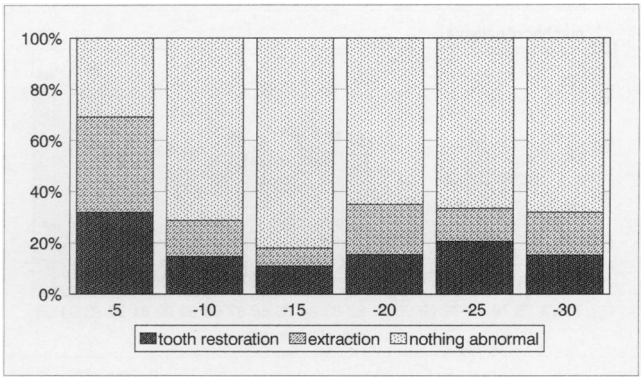

Figure 7. Therapies in dependence of the age of patients treated with endotracheal anesthesia.

whereas in the case of other patients a maximum of 25 teeth had to be extracted or 19 teeth had to be restored. Prosthetic therapy was not carried out during the period of the study but had been performed in the past in extremely rare isolated cases.

The number of teeth treated on an average for each age group, compared to the number of teeth present, is shown for each case in Figure 7. The initial decline of the curve for teeth requiring therapy might be attributed to the change from the primary dentition to the initially intact permanent dentition. Thereafter, the need for therapy increases up to the age of 20, when it tends to level off. Due to the low number of treated patients above the age of 30, meaningful statements cannot be made for this age group. However, the proportion of oral surgical therapy required seems to increase in comparison to restorative treatment.

The major part of patient treatment was concluded within the first hour. In isolated cases, the treatment sometimes lasted longer than 2 hr. Since 1992, patients have been transferred to the day clinic of the Gießen University Clinic for recovery after termination of the anesthesia. There, they are monitored by anesthetists over a period ranging from 2 to 4 hr. To date, the endotracheal anesthesias performed have been well tolerated by all of the patients, with no complications related to the anesthesia or treatment.

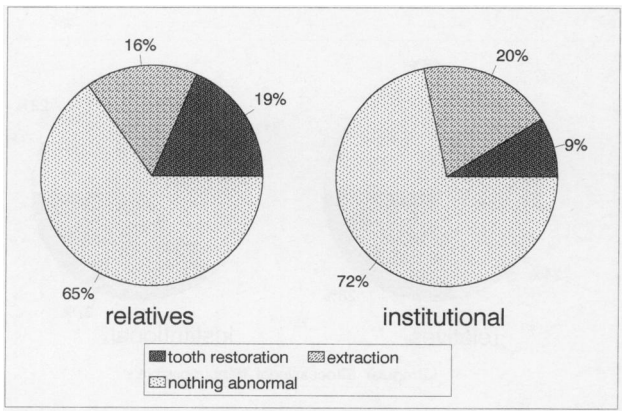

Figure 6. Types of therapies performed in patients treated with endotracheal anesthesia.

DISCUSSION

The anesthetic procedure of choice for dental treatment is local anesthesia.[1,8] Endotracheal anesthesia is indicated, however, if it is not possible to carry out extensive restoration due to the patient's inability to be treated during local anesthesia.[1–7] Patient groups frequently affected are the severely mentally handicapped, or children for whom the treatment is too demanding. The aim of dental treatment using endotracheal anesthesia for handicapped patients should always be complete restoration of the mouth cavity with therapeutic success lasting as long as possible.[1,2] Repeating the anesthesia after a short period of time should be avoided. Therefore, the emphasis in this type of treatment should be placed on tooth conservation, periodontal therapy, and surgical therapy. Prosthetic, orthodontic, or endodontic treatment is practiced rarely, as anesthesia may almost certainly have to be repeated.

For less extensive treatment, premedication or analgosedation may be used as alternatives to dental treatment using endotracheal anesthesia.[2,9–12] The advantage of the endotracheal anesthesia compared to conscious sedation in combination with local anesthesia lies in the possibility of freely carrying out extensive mouth rehabilitation within one treatment session.[7] There are no defensive movements, the operational field is open, and there is no risk of potential aspiration of foreign bodies—for example, filling materials or fragments of teeth. The risk of complications[13,14] connected with endotracheal anesthesia seems to be low when anesthesia is

performed by an anesthetist and when postoperative patients are under the control of skilled personnel.

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