Clinical Report

Dental Treatment for Patients with Physical or Mental Disability under General Anesthesia at Tokyo Dental College Suidobashi Hospital

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Abstract

Dental treatment for patients with physical or mental disability is often performed under general anesthesia due to level of cooperation with treatment, type and location of treatment, time required, or number of times patient is required to attend hospital. University hospitals are receiving an increasing number of requests from local private dentists and dental clinics to provide dental care for patients with physical or mental disability which can only be performed under general anesthesia. We carried out a retrospective survey of the routes of referral and types of dental treatment carried out in such patients under general anesthesia at Tokyo Dental College Suidobashi Hospital. The survey covered a 5-year, 9-month period from April 2006 to December 2011, during which 163 patients, comprising 106 men and 57 women, were treated. Their age ranged widely, from 2 to 53 years, with a high proportion (118 patients, 72.4%) being minors aged under 20. Among the total number of patients, 69 (42.3%) had disorders associated with mental retardation. One hundred and two patients (62.6%) had been referred from other medical institutions, with a particularly high number coming from public dental clinics for patients specializing in such patients. Conservative restorative procedures were performed in most cases (59.4%), with composite resin restorations being particularly frequent. After treatment, many patients returned to their referring medical institutions, which were responsible for subsequent management, but information on the post-treatment status was not available for some patients. Tokyo Dental College Suidobashi Hospital frequently collaborates with local medical institutions, and the present results suggest the importance of improving such collaboration.

Key words: General anesthesia—Dental treatment—Patients with disabilities

Introduction

Dental treatment for patients with physical

or mental disability (hereafter, referred to as P/MD patients) in Japan is now mostly performed at university hospitals or dental clinics

specializing in such patients operated by dental associations⁵⁾. Dental clinics for P/MD patients vary widely in terms of their facilities and staff, and few are equipped to carry out dental treatment under general anesthesia. When dental treatment under general anesthesia is required due to level of cooperation, type of treatment, time required, or number of times the patient is required to attend hospital, the patient is often referred to a special medical institution⁶⁾.

Under general anesthesia, dental treatment can be performed safely, regardless of level of patient cooperation. However, the type of treatment and the number of times it can be performed are limited¹⁾.

When providing dental treatment for P/MD patients, systemic condition must be carefully evaluated⁴⁾. When treating P/MD patients at Tokyo Dental College Suidobashi Hospital, we use general anesthesia if it is difficult to treat them using behavior control or restraints. Recently, we have been receiving numerous requests from local dental clinics for treatment of P/MD patients that can only be performed under general anesthesia. A retrospective investigation of such cases treated at our hospital would provide useful information on the future treatment of such patients. In this paper, we report the results of our investigation of dental treatment performed under general anesthesia at Tokyo Dental College Suidobashi Hospital and post-treatment in P/MD patients.

Patients and Methods

A total of 163 P/MD patients, comprising 106 men and 57 women, underwent dental treatment under general anesthesia at Tokyo Dental College Suidobashi Hospital over a 5-year, 9-month period from April 2006 to December 2011. The decision as to whether or not to carry out dental treatment under general anesthesia was made collaboratively by a dental anesthetist and the dentist responsible for treatment. A detailed explanation was given to the patient or their parent/

guardian, and consent obtained.

We carried out a retrospective survey of P/MD patients based on medical and anesthetic records of age, type of disability, source of referral, intraoperative and postoperative complications, type of dental treatment, and post-treatment status.

According to the procedures performed during each administration of general anesthesia, the type of dental treatment was classified as follows:

- (a) If a filling or veneer crown restoration was performed on the same day as pulpotomy, root canal treatment, or root canal filling, it was counted as a single tooth treatment.
- (b) In the case of indirect restoration, if treatment was carried out twice under general anesthesia, this was counted as two treatments, one for preparation and one for luting.
- (c) Scaling and application of medication were not counted as treatment.

Results

The age and sex of the patients are shown in Fig. 1. For patients who underwent treatment under general anesthesia more than once during the survey period, age at the time of initial treatment is given. Overall, patients comprised 106 men (65.0%) and 57 women (35.0%). The age ranged from 2 to 53 years. In terms of age distribution, the largest age group comprised 66 patients (40.5%) aged between 2 and 9 years. A greater proportion of the patients (118 patients, 72.4%) were minors aged below 20 years.

The types of disability are given in Table 1. The most common condition was autism, followed by disorders and syndromes associated with mental retardation, mental retardation alone, or cerebral palsy associated with mental retardation.

The routes of referral are shown in Fig. 2. The most common route of referral was *via* public dental treatment centers, with 102 patients (62.6%). This means that collaboration with other medical institutions involved a total of 155 patients (95.1%), the great

Fig. 1 Age and sex of patients

Table 1 Type of disability

	Number of patients	(%)		Number of patients	(%)
Mental retardation	69	(42.3)	Syndromes with mental retardation	36	(22.1)
			Mental retardation alone	33	(20.2)
Pervasive developmental disorders	69	(42.3)	Autism	57	(35.0)
			Developmental disorders	12	(7.4)
Cerebral palsy	21	(12.9)	Cerebral palsy with mental retardation	17	(10.4)
			Cerebral palsy	4	(2.5)
Other disability	4	(2.5)	Psychiatric disorders	3	(1.8)
			Higher brain dysfunction	1	(0.6)
Total				163	(100)

majority. Only 8 patients (4.9%) came to our hospital without being referred by another medical institution.

The 163 patients in the survey underwent 193 procedures under general anesthesia. Average treatment time was 2 hrs 20 min (range 40 min to 8 hrs 7 min). Treatment took 8 hrs or more in only one case; in 118 patients (97.4%) treatment was completed within 5 hrs. No severe intraoperative or postoperative complications occurred in any patient. Two patients underwent emergency treatment under general anesthesia to treat pain due to trauma or acute periapical periodontitis. Including 9 patients (5.5%) who underwent planned procedures twice, 16 (9.8%) underwent treatment between 2 and 5 times. According to the conditions mentioned in the Methods,

Fig. 2 Route of referral

1,812 teeth were treated. The average number of teeth treated during each general anesthesia was 9.3 (range 1–25).

Table 2 Type of dental treatment

	Number of teeth	(%)	With endodontics	(%)
Sealant	76	(4.1)	—	—
Conservative restoration	1,076	(59.4)	90	(5.0)
Veneer Crown	196	(10.8)	130	(7.2)
Abutment teeth of bridge	10	(0.6)	4	(0.2)
Endodontics	10	(0.6)	—	—
Extraction of teeth	332	(18.3)	—	—
Extraction of teeth (the third molar)	109	(6.0)	—	—
Others	3	(0.2)	—	—
Total	1,812	(100)	224	(12.4)

Table 3 Type of conservative restoration

	Number of teeth	(%)
Composite resin restoration	962	(89.4)
Amalgam restoration	20	(1.9)
Glass ionomer restoration	21	(2.0)
Inlay restoration	73	(6.7)
Total	1,076	(100)

Table 4 Type of veneer crown

	Number of teeth	(%)
Stainless steel crown	118	(60.2)
Composite resin crown	39	(19.9)
Cast crown	39	(19.9)
Total	196	(100)

The types of treatment are given in Table 2. The most frequently performed procedure was conservative restoration (59.4%), followed by extraction of 332 teeth (18.3%). Endodontic treatment was performed in 224 teeth (12.4%), and was carried out simultaneously with veneer crown placement in 130 teeth (7.2%) and with conservative restoration in 90 (5.0%).

The types of conservative restorations performed in 1,076 teeth are shown in Table 3. The types of veneer crowns are given in Table 4. The types of endodontic treatment are given in Table 5. Vital pulpotomy was

the most frequently performed procedure.

Hospital attendance after treatment is shown in Fig. 3. After undergoing treatment under general anesthesia, 94 patients (57.7%) returned to their referring medical institution and were managed there. Forty-one patients (25.2%) continued to attend our hospital for regular examinations and treatment. Information on the post-treatment status of dental care was not available for 20 patients (12.3%). A further 8 patients (4.9%) were referred by our hospital to other medical institutions as they had moved to other areas.

Table 5 Type of endodontic treatment

	Number of teeth	(%)
Vital pulpotomy	133	(59.4)
Pulpectomy and root canal filling	62	(27.7)
Pulpectomy	0	(0.0)
Root canal treatment and filling	19	(8.5)
Root canal treatment	9	(4.0)
Root canal filling	1	(0.4)
Total	224	(100)

Fig. 3 Hospital attendance after treatment

Discussion

The greater proportion of patients undergoing dental treatment under general anesthesia were men. This was consistent with previous reports on dental treatment under general anesthesia^{3,10-13}. The reported reasons for the larger number of male patients include the greater prevalence of autism among males³ and the difficulty of restraining them due to physical build and strength¹³. This would also account for the situation in such patients at our hospital.

A greater proportion of the patients (72.4%) comprised minors aged below 20 years. The age distribution of patients in other institutions varied according to circumstances^{3,10-13}. Possible reasons for the large number of young patients here include the fact that they have more opportunities to undergo dental checkups during which caries can be iden-

tified, and it is easier for parents or guardians to accompany them to hospital compared with adults. Other reasons were that the number of remaining teeth in P/MD patients was markedly smaller than that in healthy subjects⁷, and that they have fewer opportunities to attend a dental clinic.

Most disabilities were disorders associated with mental retardation. This tendency was almost identical to those reported at other institutions. This is because patients with severe mental retardation or autism have little understanding of dental treatment and can be uncooperative, which makes management extremely difficult. Patients with psychiatric disorders or higher brain dysfunction may also undergo treatment under general anesthesia, and in an aging society the number of patients is expected to increase.

The greatest number of patients (62.6%) was referred by public dental treatment centers. When severe P/MD patients attend local dental treatment centers which do not possess facilities for general anesthesia, they are frequently referred to our hospital for treatment that requires general anesthesia. Reports from other institutions did not identify the routes of referral, and therefore the data could not be compared. It may, however, be due to the fact that our hospital is a highly reputed medical institution. Few patients came to our hospital *via* the internet or personal introduction; however, the number of such patients is expected to increase in the future.

Almost all treatment consisted of procedures to treat caries. The average number

of teeth treated during each administration of general anesthesia was 9.3 (range 1–25). This is similar to the averages of 8–13 teeth reported at other institutions^{3,10–13}. Average treatment time was also very similar to that reported at other institutions at 2 hrs 20 min. The scheduled time of treatment in the patient in whom treatment took longest (8 hrs 7 min) was 5 hrs. Treatment of the molar in this particular case was very difficult due to trismus owing to Werdnig-Hoffman disease.

Most caries treatment comprised conservative restoration, very similar to the trend reported at other institutions^{3,10–13}. Most conservative restoration procedures involved drilling and were completed in a single treatment, with composite resin restorations placed in the great majority of cases. Similarly, a stainless steel or composite resin crown was placed in most cases and all procedures were completed in a single treatment. This was because many patients attended our hospital to solely undergo treatment that required general anesthesia, meaning that several treatment visits would impose a heavy burden and the demand to complete procedures in a single visit was high.

There was a wide variation in previously reported extraction rates. In recent years, the rate of extensive caries requiring pulp treatment or extraction among P/MD patients has reportedly been decreasing, indicating a decline in the severity of caries^{2,3,9}. According to Morisaki⁸, the clinical polarization of patients is becoming apparent, with some, albeit few, patients presenting with advanced, severe caries affecting several teeth. In this study, conservative restoration accounted for the majority of treatment, but extraction was the next most common procedure. This reflects the polarization of caries.

Procedures other than caries treatment included those for which general anesthesia was indicated due to a high level of surgical invasiveness, including extraction of supernumerary teeth and third molars and fenestration of impacted teeth.

Regular checkups and maintenance are important following comprehensive dental

treatment. We strongly recommended regular checkups and maintenance to patients, parents and guardians. After completion of treatment under general anesthesia, many patients returned to their referring medical institutions, where they underwent supportive care, while 25.2% continued to attend our hospital for regular examination and treatment. A further 4.9% were referred to other medical institutions by our hospital as they were moving to other areas. Information on post-treatment status was not available for 12.3%, and guidance and prognosis was a matter of concern here. Post-surgical guidance during regular examinations was insufficient, indicating the need for greater consideration to be given to this topic.

Tokyo Dental College Suidobashi Hospital frequently collaborates with local medical institutions, and the present results suggest the importance of improving such local collaboration.

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