Third molars in Norwegian general dental practice

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Berge TI. Third molars in Norwegian general dental practice. Acta Odontol Scand 1992; 50:17–24. Oslo. ISSN 0001-6357.

A questionnaire containing 37 questions on oral surgery was mailed to a systematic random sample of 500 Norwegian general dental practitioners in October 1989. A 60% return rate was obtained. A selected part of the questionnaire was also presented to all 5th-year dental students in Bergen and Oslo. The total return rate was 43%. From the 17 questions dealt with in this paper the following conclusions were drawn: Norwegian general practitioners' attitudes towards indications for third-molar removal are in general agreement with the current conservative approach. Norwegian 5th-year dental students had more radical attitudes. Norwegian general practitioners indicated the use of adequate technical measures when surgically removing third molars in practice. Every month 4.3 patients presented to general practice with symptoms or findings indicating removal of an impacted or partially erupted third molar. This suggests that in 1 year a situation indicating third-molar removal will occur in 20% of the patients who have third molars. □ *Epidemiology; impacted teeth; oral surgery; questionnaire survey*

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Surgical removal of impacted or partially erupted teeth is performed by 83% of Norwegian general practitioners (1). In addition, general practitioners refer more than 12 patients annually to oral surgeons in Norway (1), of which third-molar problems seem to represent a major part. The practitioner thus plays an important role as a first-line diagnostician of third-molar problems and also as provider of treatment for less complicated conditions associated with third molars.

Removal of asymptomatic totally or partially impacted third molars in the anticipation of future morbidity has become a matter of controversy since the NIH Consensus Development Conference in 1979 (2). This conference recommended studies to evaluate lesions or morbidity associated with impacted third molars. Several studies have been published attempting to penetrate this subject. However, they seem to have been confined to cross-sectional and/or radiographic investigations (3–6) or longitudinal clinical studies on a selected population (7).

On the basis of these studies, recommendations on indications for third-molar removal seem to have changed towards a more conservative approach in recent years (8, 9). In Sweden, an increasing volume of referrals for third-molar removal has been noted (10), indicating that this new trend has not been adopted by general practitioners.

The aim of this study was to evaluate Norwegian general practitioners' views on indications for third-molar removal, some technical details of practice when general practitioners perform this type of surgery, and the incidence of situations in general practice in which removal of third molars may be indicated.

Materials and methods

A questionnaire containing a total of 37 questions was mailed to a systematic random sample of 500 Norwegian general dental practitioners (GPs) in October 1989. The

return rate was 60%, indicating that a response of 8.5% of the total population of GPs was attained. Details of the selection of the GPs to receive the questionnaire and of the distribution of respondents compared with the population in accordance with demographic variables have been published in a preceding paper (1). No statistically significant group differences in accordance with sex, age, geographic region, or type of practice (private/public) were noted between respondents and the total population.

Seventeen questions with only closed response alternatives were used in this paper. A short version of the questionnaire, containing questions on indications for third-molar removal, was also given to all 5th-year students at the dental schools in Bergen and Oslo by registered mail. The total response rate for the students was 43%. The age and sex distribution of the student respondents showed no significant deviation from the total population of 5th-year dental students.

The wording of the questions is shown in tables and figures. To obtain the respondents' views on indications for removal of third molars, the questionnaire described the following clinical situation: 'You are consulted by a healthy patient, age between 25 and 50 years, without crowding or spacing in the quadrant in question. On clinical and radiographic examination you find the following situations: (no subjective symptoms unless specified). Would you remove, or refer to have this third molar removed, at this time?'.

Statistics

Pearson's chi-square test and Student's *t* test were used to test bivariate differences between proportions and means, respectively. Unless specified, differences did not reach significance at the 5% level. Multiple classification analysis (MCA) (11) was used to assess the bi- (eta) and multi-variate effects (beta) of predictor variables and the proportion of variance in the dependent variable explained by all predictors together (multiple R squared). The predictor variables were sex, age, region of residence, and type of practice (private/public).

Results

Indications for third-molar removal

The views of the GPs and the 5th-year students on indications for third-molar surgery are presented in Table 1.

Table 1. Views of general practitioners and dental students on indications for removal of third molars

Problem	Would remove third molar (%)							
	General practitioners				Dental students			
	n	Yes	No	In doubt	*n*	Yes	No	In doubt
Partially erupted third molar with local inflammation, chronic or subacute type	297	92	3	5	29	100	0	0
Partially erupted third molar without local inflammation	289	34	48	18	29	38	52	10
Impacted third molar with associated cystic lesion	298	92	5	3	29	90	7	3
Impacted third molar without oral communication and without covering bone: soft tissue impaction	293	18	56	26	29	45	34	21
Impacted third molar with covering bone: bony impaction	293	6	81	13	29	17	76	7
Ectopically impacted third molar without pathologic findings	293	15	59	26	29	24	59	17
Impacted third molar and diffuse symptoms/pain from the area, no other findings	296	47	16	37	29	59	14	27

All students and 92% of the GPs would remove a partially erupted third molar *with* evidence of local inflammation. Male GPs seemed more reluctant to operate and less in doubt than female GPs ($p < 0.05$). Given the same situation, but *without* evidence of local inflammation, only slightly more than one-third of both GPs and students would consider removal. The GPs appeared to be slightly more in doubt than the students. Approximately 90% of both GPs and students would remove an impacted third molar with an associated cystic lesion. With regard to soft tissue impaction, the students were markedly more radical about removing than the GPs ($p < 0.01$).

The percentage of respondents in favor of removal decreased when considering bony impaction. Again the students tended to be more radical, but not significantly so ($0.10 > p > 0.05$). Younger GPs, in accordance with time since graduation, appeared to be more in doubt and less radical than older colleagues ($p < 0.01$). Both GPs and students considered ectopically impacted third molars without pathologic findings to be more in need of removal than simple bony impactions, and again the students were more radical. The most recently graduated GPs expressed more uncertainty and correspondingly lower frequency of decisions not to remove the third molar ($p < 0.05$). The last clinical situation consisted of an impacted third molar with diffuse symptoms/pain from the area. Again the students were more radical and less in doubt than the GPs.

Except for the situations noted above, MCA showed no significant bi- or multivariate differences in treatment preference in accordance with the respondent's sex, year of graduation, geographic location, type of practice (private/public), or place of graduation.

Technical measures when surgically removing third molars

The GPs were asked to indicate the application of several technical measures when surgically removing third molars necessitating mobilization of a mucoperiosteal flap. The responses to these questions are summarized in Table 2. A gauze pack or drain was removed after 1 week (25%), after 3 days (25%), or after 1 (14%) or 2 days (15%). All respondents used sutures; the average number was 2.6 (range, 1–5). Only 5% used resorbable sutures. Eleven per cent indicated prophylactic use of antibiotics. Of these, 25% gave a single dose of 200–600 mg metronidazole in conjunction with the procedure. The rest indicated use of penicillin or, in case of hypersensivity to penicillin, erythromycin for 1–5 days. Of the 170 respondents indicating routine use of postoperative analgesics, 63% used a paracetamol–codeine preparation, compared with 35% using ibuprofen. The indicated average

Table 2. Frequency of application of measures when removing third molars surgically* in own practice

Use of	Respondents, *n*	Yes, %	No, %
Preoperative antiseptic mouthwash (chlorhexidine)	254	18	82
Irrigation with sterile saline (for example, when using bur)	250	64	36
Gauze drain or pack	250	80	20
Routine antibiotics†	257	11	89
Routine analgesics	254	67	33
Routine follow-up	250	92	8

* Including the mobilization of a mucoperiosteal flap.
† Otherwise healthy patients.

Table 3. Mean number of patients ($\bar{x}$) seen with complaints or pathologic conditions associated with an impacted or partially erupted third molar during 1 month in general practice

Type of practice	Respondents, *n*	Patients per month		
		$\bar{x}$	SD*	95% confidence interval
Private	177	5.1	4.8	5.8–4.4
Public	98	2.7	2.6	3.2–2.2
Total	275	4.3	4.4	4.8–3.8

* SD = standard deviation.

period of follow-up was 6 days, with a range of 1 day–3 months.

Finally, the respondents were asked to indicate the number of patients seen in practice during the past month with complaints or pathologic conditions associated with impacted or partially erupted third molars. Table 3 shows that private practitioners saw nearly twice as many such patients as publicly employed practitioners (bivariate analysis, $p < 0.05$). MCA (Table 4) shows that the predictor variables explain only 16% of the variance in frequency of third-molar problems. However, a tendency for private practitioners less than 45 years old to see more such patients was noted. The small deviations between etas and betas indicate weak correlations between predictor variables.

Discussion

A general validity discussion concerning the response from the GPs has been presented in a preceding paper (1). The response rate from the students was low, which may imply an overrepresentation of especially interested students. However, as 43% of the total population of 5th-year students answered, the response should be considered valid also for this group.

Indications for third-molar removal

Pericoronitis has been found to be a major indication for third-molar removal (12, 13). The NIH Consensus Conference (2) stated that impacted teeth that develop soft tissue inflammatory conditions (pericoronitis) should be removed. There seems to be general agreement among the respondents of this study that a partially erupted third molar with pericoronitis should be removed. Indications for removal of partially erupted third molars without symptoms are controversial (8, 9, 13). In these situations recurrent episodes of pericoronitis, periodontal lesions, and caries with sequelae are distinct possibilities. As stated at the NIH Consensus Conference (2), however, there is a lack of studies on incidence and recurrence rates of these conditions. Indications then will be a balanced decision between these unknown factors and the possibilities of postoperative sequelae (14, 15), which for periodontal defects are known to increase after the age of approximately 25 years (16). In this context it is interesting that the proportion of GPs indicating removal of partially erupted third molars dropped to 34%.

Table 4. Multiple classification analysis to assess the effect of four predictor variables on the number of patients seen in general practice with third-molar problems during the past month (grand mean, 4.15; $n = 253$ dentists*)

Predictor variable	Unadjusted eta	Adjusted beta
Sex of dentist	0.17	0.15
Age of dentist	0.23	0.24
Region of practice	0.15	0.12
Type of practice	0.27	0.23

Multiple $R^2 = 0.16$; $p < 0.01$.
* Missing cases were excluded.

When a cystic lesion is associated with an impacted third molar, there appeared to be agreement on removal among the respondents. This type of abnormality may be the most prevalent one with fully impacted third molars (12) and constitutes a clear indication for surgical intervention, according to the NIH Consensus Conference (2) and others (8, 9, 17).

A situation defined as soft tissue impaction—that is, a third molar without communication between the follicular space and the oral cavity but without covering bone—was assessed differently by the two groups of respondents. The students were significantly more aggressive concerning removal than the GPs. It is remarkable that a higher proportion of the students would remove a soft-tissue-impacted third molar compared with a partially erupted one without local inflammation. These preferences are, however, reversed in the GP group. As soft-tissue-impacted third molars have been shown to have a potential for eruption, at least in younger age groups (7), and as the risk of soft-tissue inflammation is reduced, indication for removal should be considered weaker, the deeper the third molar is located. This view is supported by Ash et al. (18) and Lysell & Rohlin (12).

In a situation of bony impaction—that is, impacted teeth with covering bone surrounding the crown—both groups and especially the general practitioners seem to be in agreement with the current conservative approach to removal of impacted third molars (8, 9). The effect of long clinical experience may explain the increased aggressiveness concerning removal among the 'older' practitioners.

Ectopically impacted third molars without pathologic findings were by both groups found to be more in need of removal than simple bony impactions. No specific recommendations have been found in the literature for this situation, which may be of rare occurrence (4).

Osborn et al. (15) and Lysell & Rohlin (12) found independently that 2% of all third-molar removals were due to unspecified facial pain. Norwegian 5th-year dental students indicated more agreement with Lytle (19) and Guralnick (17), who recommend removal of impacted third molars with diffuse symptoms or pain, than with the GPs. This may suggest that practitioners have experienced third-molar surgery to have less long-term effect on diffuse facial symptoms or pain than previously assumed.

The tendency for the students to be more radical and less in doubt than the practitioners was consistent in all clinical situations but one. This partly reflects current teaching by a faculty of specialists in oral surgery transferring their more radical attitudes to the students. A study from the USA demonstrates such differences between oral surgeons and general practitioners concerning attitudes on removal of third molars (20). In addition, the differences in attitudes reflect the effect of years of clinical practice. The practitioners have been able to observe a considerable number of third molars for extended periods of time, and this experience may have influenced their views on indications for removal. On the other hand, the large number of patients reported to have problems with partially or fully impacted third molars should have resulted in a more radical approach by the practitioners.

Surgical technique

The response to the questions on technical measures when removing third molars in general practice indicated that most of the practitioners apply an adequate technique when performing this type of surgery. Preoperative mouthwash with chlorhexidine has been recommended (21). Others have found no effect on postoperative complications (22) or on the immediate postoperative inflammatory reaction (23). The indicated low use of this measure among the respondents may suggest that it is considered to be of little value. A gauze drain or pack was used in the third-molar wound by 8 of 10 respondents, indicating belief in a positive effect on postoperative symptoms, as described by Hellem & Nordenram (24). All respondents used sutures, indicating that at least partial closure of the wound is performed. Holland & Hindle (25) found that partial closure and a dressing significantly

reduced postoperative pain and swelling. Others (26) have found no difference between partial wound closure with and without a gauze drain. The use of an average of 2.6 sutures indicates that a tight wound closure is frequently applied, and in this situation the use of a drain would be favorable.

The routine use of systemic antibiotics is reported by only 1 of 10 practitioners. This figure is remarkably low, considering several reports claiming beneficial effects of penicillin V or metronidazole on postoperative pain, swelling, and trismus (23, 24, 27) and of metronidazole on the frequency of postextraction alveolitis (dry socket) (28, 29). The issue is controversial, however, as some reports demonstrate no effect of systemic antibiotics in third-molar surgery (30, 31). Owing to expected underreporting of average or typical operating time, this question was omitted. A somewhat discouraging finding was that 33% did not use analgesic medication routinely after third-molar surgery. An overwhelming number of reports (for example, 24–26, 32) clearly document the benefit of analgesics in nearly all patients after third-molar surgery when a mucoperiosteal flap has been mobilized.

Incidence of third-molar problems in general practice

The number of patients seen in general practice with complaints such as pain, discomfort, or food impaction or with clinically or radiologically detectable pathologic lesions associated with impacted or partially erupted third molars was on an average 4.3, with a 95% confidence interval of 3.8–4.8, during 1 month. This was indicated to account for 3% of all consultations in practice. Simple extrapolation gives a total of approximately 5.3 million consultations in Norwegian general dental practice per year, which equals on an average approximately 1 consultation every working hour for all 3538 Norwegian general practitioners. This indicates that the present figures on third-molar problems are not unrealistic. The difference in number of such cases seen in private and public practice corresponds well with differences in patient populations, as most patients in public practice are too young to be at risk of third-molar problems. MCA indicates that patients with third-molar problems are seen by all types of general dental practitioners, as only 16% of the variance was explained by all predictor variables together.

A risk of overreporting these situations exists, as they may be well remembered, representing a break in the daily routine, and, in addition, some cases will represent recurrences. On the other hand, patients attending specialist clinics, oral surgery departments at hospitals and at the two dental schools in Norway, general medical practitioners, and ear, nose and throat (ENT) specialists without referrals from general dental practitioners will escape registration and will to some extent counteract the effects of possible overreporting and recurrences. A study from Israel (33) indicates that the incidence of pericoronitis, which is indicated as a major reason for removal of third molars (12), peaks in June and December. Consequently, the present period of registration, September–November, should be representative for the year average.

There are about 3.3 million Norwegians over 16 years of age. Assuming from recent Swedish investigations (10) that two-thirds of them have at least one third molar present, and that 40% are impacted or partially erupted, the number of patients at risk of third-molar problems will be approximately 900,000. During 1 year 183,000 patients with subjective or objective problems related to third molars are seen by the 3538 Norwegian general dental practitioners (34), giving an incidence rate of 200 per 1000 per year of possible indications for third-molar removal.

The occurrence of third-molar problems found in this study is considerably higher than indicated from previous investigations. Stanley et al. (4) found that 12% of an impacted third-molar population would be expected to develop some type of problem. The study comprised over 11,000 patients from a Veterans Administration and dental school patient population but was limited to radiographic examination. Eliasson et al. (3) found 5–8% of impacted third molars to have

pathologic changes. The study was limited to patients 30 years of age or older and to radiographic examination only. Sewerin & von Wowern (5) found, in a longitudinal radiographic study of volunteer dental students, unpredictable changes in the position of third molars, many towards a state of full eruption. In a clinical 4-year longitudinal study comprising 70 volunteer dental students von Wowern & Nielsen (7) found a tendency toward full eruption of previously impacted third molars; 26% of the observed third molars were removed owing to symptoms during the observation period. Ahlqwist & Gröndahl (6) found, in a radiographic study of middle-aged and older Swedish women, that 8% had at least one impacted tooth, of which 16% were associated with predominantly stable pathologic conditions. This indicates that the third-molar problems found in this study most likely occur in younger age groups.

The figures for pathologic changes associated with third molars should be considered minimum frequencies. The reason for this is twofold. The patient population studied and the sample selection constitute the first factor. The magnitude of the dropout problem in the selected patient group is unknown. Patients with a high level of dental problems are probably less likely to participate in such investigations, which indicates that the true occurrence is higher than reported. Second, since pericoronitis is one of the most frequent indications for third-molar removal (12), clinical and anamnestic informations are mandatory when trying to estimate the true incidence of third-molar problems in the general population at risk.

The present study is an attempt to overcome these limitations, as it comprises the Norwegian population seeking dental treatment from general practitioners. However, an unknown number of patients without regular visits to a dental practitioner with expected above average incidence of third-molar problems will cause the presented figures of third-molar problems to be lower than the 'true' incidence.

On the basis of this rather high reported incidence of third-molar problems in general practice, it is surprising to note the Norwegian practitioners' conservative attitude toward removal of impacted or partially erupted third molars at risk of developing pathologic conditions. In spite of the need for further and more penetrating analysis of which patients and types of third-molar situation in which problems dominate, the results of this study suggest that a more radical approach to removal of symptomless partially erupted third molars than reported by Norwegian GPs might be appropriate.

The following conclusions can be drawn from this study:

Norwegian general practitioners' attitude towards indications for third-molar removal is in general agreement with the current conservative approach. Norwegian 5th-year dental students tend to have a more aggressive approach.

Norwegian general practitioners seem to apply adequate technical measures when removing third molars surgically in their own practice.

The frequency of subjective or objective pathologic conditions reported to be associated with impacted or partially erupted third molars in a general practice patient population indicates that any patient at risk will experience a possible indication for removal every 5th year. This may be considered supportive of the concept of prophylactic removal of partially erupted third molars.

Acknowledgement.—The valuable advice of Professor Ola Haugejorden, Bergen, is greatly appreciated.

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Received for publication 26 June 1991