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Trends in endodontic claims in Italy

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According to the scant data available in the literature, endodontic claims are common among dental professional liability cases and the second most common type of claim. This study aimed to describe the characteristics of endodontic claims in Italy and the most frequently disputed errors, and the discussion below includes consideration of ethical and medico-legal aspects thereof. We retrospectively analysed 120 technical reports written on cases of professional malpractice in endodontics in the last 5 years. The complainant patients were males in 22.5% of the cases, while females made up the remaining 77.5%. In the dentist sample, male operators were more often involved in litigation cases (80%) than female operators. The most frequently claimed technical errors were: lack of a complete filling of root canal/s (71.7%), the perforation of tooth structure (12.7%), extrusion of sealing materials beyond the apex of the tooth (9.6%) and the fracture of an endodontic instrument (5.9%). In 1.7% of cases it was found that the expert did not make any errors performing the endodontic therapy. In only very few cases (2.7%) no therapy was considered necessary, while the most common therapeutic solution involved in endodontic misconduct was tooth extraction (53.0%). In many cases the dentist preferred to extract the endodontically undertreated tooth and substitute it prosthetically rather than trying to re-treat it. The discrepancy between the total number of cases examined and those that eventually go to court leads us to believe that the majority of endodontic malpractice cases are resolved in out-of-court settlements.

Key words: *Endodontics, dental complaints, dental liability insurance, dentist–patient communication, endodontic negligence*

In recent years the number of litigation cases involving dental professionals has risen and this trend seems fostered by the erroneous thinking of patients that any unsuccessful dental treatment invariably corresponds to professional misconduct[1,2]. In recent decades the expectations of dental patients have generally increased, at least partly owing to being misled by the media, which often promises excellent results that are not always attainable in some specific clinical circumstances. The information given by the dentist to his patient is not always able to reset these expectations, and so the perception of a negative (or unsatisfactory) result of the therapy may lead the patient to sue the dentist. Moreover, in Italy, almost 90% of patients bear the costs of dental treatments directly and completely because very few interventions are carried out for free by the National Health System, and patients often choose to turn to their preferred private practitioner's care. Hence, the combination of self-payment for dental care and high expectations of success are considered the main causes of dental litigation in Italy.

According to the data retrievable in the literature[3–7], claims in endodontics are common among dental liability cases and it is widely held that regular publication of such data would be of great help for dentists, revealing the most frequent errors or those events perceived as errors by the patients. Thus the dental professionals, in becoming more aware of the medico-legal risks, could reconsider their own professional practice, adopting risk-prevention procedures, focusing on the relationship with the patient and choosing the most suitable insurance coverage[7].

Indeed, very few authors publish malpractice data so there is no structured national database of insurance complaints or verdicts, making detailed information about endodontic claims very limited and sparse[5]. The available studies mostly describe the experiences of local institutions or report simple case studies and data depicting the wider trends of endodontic malpractice claims for a whole nation are seldom available. Moreover, no studies have considered the global national situation of dental litigation in Italy and only limited data have been published. The most significant report was published in 2011 by Manca[8], who examined 201 verdicts from the civil courts (general and appeal) in Rome from 2004 to 2009 and reported that prosthetic treatments (including implantology) are most frequently disputed in

court (47%), while endodontic procedures are the second most commonly disputed treatments (19%). This present paper is limited to the civil suits filed in two Italian courts and it does not focus on technical errors or malpractice complaints because the associated expert witness reports were not accessible to the authors and thus could not be incorporated into their analyses.

The lack of available data concerning dental litigation in Italy occurs mainly because no institutions or agencies systematically collect the relevant data from the civil courts, and insurance companies are somewhat reluctant to make their data available to the public. Furthermore, in contrast to many other countries, Italian health professionals are not bound to report the instigation or the suspicion of legal action against them by patients to any national department or regional disciplinary board.

Because it is widely held that in Italy a substantial proportion of dental disputes are resolved by means of an out-of-court settlement and compensated by insurance companies, the analysis of data from the insurances becomes more important to reveal the true occurrence and features of litigation. Since 2001, the National Association of Italian Dentists (ANDI) has provided to its members a professional liability insurance policy, dedicated to private practitioners, in a joint venture with a reputable Italian insurance company. Subscriptions to this policy have increased from a few hundred in 2001 to more than 10,000 in 2011, and some of their data are available for analysis and discussion. The insurance company also recruited as dental advisors those dentists who proved to be trained and experienced in medico-legal evaluation of damages and professional negligence.

The present study aimed to investigate the characteristics of endodontic claims in Italy, focusing mainly on the most frequently alleged errors, the alleged damages and the influence of the patient–dentist relationship on complaints, thus addressing the most important medico-legal concerns raised by endodontic litigation.

MATERIALS AND METHODS

In 2001, a new insurance policy provided by ANDI was initiated, and 354 dentists in that first year, 7679 in 2010 and over 10,000 in 2012 subscribed to such an insurance contract. Given the possible statistical influence of the gender of the dentist, we also considered the sex distribution of ANDI members, which comprised 17,508 male (76%) and 5486 (24%) female members (from a total of 22,994 regular members) in January 2012. In the period between 2001 and June 2010, a total of 1230 claims were submitted to the ANDI insurance company, the most predominant of which were as follows: implantology (25%), prosthetics (24%), endodontics (19.3%), oral surgery (18.2%), orthodontics (7.5%), anaesthesia (2.5%) and other (3.5%). Of the endodontics cases (a total of 237), we selected 117 cases involving a total of 120 teeth on the basis of well-defined predetermined inclusion criteria.

The inclusion criteria applied during selection were:

- Cases examined between 2006 and 2010. We excluded cases arising from 2001 to December 2005; because of the comparatively low number of insurance policies subscribed to during this initial period, we decided that including them may have rendered the sample less representative of the broader, currently existing trends in dental litigation.
- Availability of a technical report provided by the dental advisor to the ANDI.
- Inclusion in the dental advisors' reports of details such as the sex and age of the patient and the dentist, the kind of negligence claimed and the damages suffered as a consequence of the alleged misconduct.

To facilitate informative discussion of the cases, the technical errors reported were classified as follows: inadequate filling of the root canals (short, leaking, not all root canals filled, etc.) and periapical lesions; extrusion of material beyond the root apex, fracture and retention of an endodontic instrument in the root canal; and perforation of the dental structure (root or pulp chamber of the tooth). In addition the lack, or presence of certain documentation and the correctness of it was considered, particularly with regard to clinical documentation such as X-rays, patient files and photographs. The damages arising from alleged endodontic misconduct have been grouped as follows: tooth extraction; necessity of endodontic re-treatment; apical endodontic surgery; and loss of previous crown and bridge reconstructions. In some cases, the mistreated tooth received more than one allegedly incorrect or unnecessary treatment.

Patients were requested to give their written consent for the visit performed by the expert appointed by the insurance company. The data were collected anonymously, except for the sex and the age of patients, thus overcoming the necessity for a further formal consent. No ethical board was requested to review or approve the present research.

RESULTS

Assessing and resolving treatment-related disputes between dentists and patients can be a time-consuming procedure. Possibly as a result of this, in 17% of the cases examined in the current study, a civil suit had already been filed before a visit and medico-legal advice from the insurance expert had been procured.

The sample of patients launching claims comprised 22.5% males and 77.5% females, with a prevalence of patients aged between 30 years and 40 years in both genders (47% of the females and 59% of the males). It emerged that male dentists (80%) were more likely to be involved in litigation cases than female dentists. Because the general ratio of the dentist members of ANDI is 76% males and 24% females, we could conclude from these data that male dentists are more likely to become involved in litigation than female dentists. However, such conclusions should be drawn with caution because in Italy, neither the male to female ratio of dentists who practise endodontics, or the gender ratio of the patients who use their services, are known.

The most frequent technical error resulting in cases that conformed to the inclusion criteria of this study was lack of a complete filling (underfilling) of the root canal/s (*Table 1*). Radiographic documentation was not included in the relevant insurance reports, thus objective judgment of the root-filling quality and the consequent damage could not be made in the course of this research. The criteria adopted to assess endodontic underfilling were not always detailed in the relevant technical reports, but the insurance advisors mainly defined filling defects according to criteria consistent with those reported in international guidelines and, in particular, with the criteria published in the recommendations of the European Society of Endodontology[9], which states that: '*No space between canal filling and canal wall should be seen. There should be no canal space visible beyond the end point of the root canal filling*'.

The percentage of underfilled teeth that were deemed to be irreversibly compromised was relatively high in the current study, and extractive therapy was conducted slightly more frequently (47%) than endodontic retreatment (46%). Perforation of the root was the second most frequent error claimed for in our research, with 15 cases (13%). Of these 15 cases, removal of the tooth was recommended in 13 (87%). Less frequent was the extrusion of sealing materials beyond the apex of the tooth (9.6% of cases), an occurrence sometimes caused by incorrect determination of the working length or of apical gauging. In our sample, the extrusion of endodontic material beyond the apex (11 cases) was associated with pathological consequences of surrounding structures in 89.5% of the relevant samples, i.e. neurological sequelae (anaesthesia/paraesthesia of the trigeminal nerve) in 42.1%, sinusitis in 36.8% and cystic lesion in 10.5% of cases[10,11]. These data provoked consideration of the possibility that pathological indications in surrounding structures had been the initial evidence that supported the claim. The extrusion of endodontic materials beyond the root apex sometimes occurs, but only in relatively few of these cases does this have an effect on bone or other anatomical structure.

The fracture of an endodontic instrument was evident in 5.9% of the case reports considered in our study. This could be hypothesised as being primarily a consequence of the incorrect use of endodontic files during root canal preparation or, alternatively, as arising primarily from poor instrument maintenance or the improper substitution of worn instruments. On occasion, broken files can serve as filling points and do not contribute to any pathology of the tooth or periapical tissues; in such cases liability claims mounted against the dentist would be unlikely to succeed[7]. In any event, the patient should be informed of the incident. When an endodontic pathology suspected to be related to a broken file occurs, the endodontic treatments adopted to remove it do not always result in a successful outcome and generally result in higher costs (related to specialist procedures, microscopy intervention, etc.) than those associated with a 'first instance' endodontic procedure.

In 26% of the cases included in this study, using the above-described criteria, endodontic complication caused the loss of a prosthetic crown applied to the tooth and in 24% the loss of a bridge.

In 2.5% of the cases examined in this study, the insurance experts recommended rejection of the claim because the case was not based on any demonstrable clinical or radiographic error occurring during the endodontic therapy. It should be mentioned that in no case was the non-use of a rubber dam suggested as a possible cause of endodontic complications by the complaining party; thus, no technical reports focus on this specific procedure. In addition, no cases involved negligence of the endodontist based solely on an alleged breach of duty of disclosure of information to the patient or lack of written consent to the therapies undertaken.

Table 1 Number and percentages of technical errors and of related treatments

% Technical error	Underfilling	Overfilling with extrusion	Perforation	Broken file	None	Lack of proper documentation
Total percentages	71% (87)	9.6% (11)	12.5% (15)	5.9% (7)	2.5% (3)	55% (64)
No therapy	0	9% (1)	0	0	67% (2)	
Extraction	47.2% (41)	36% (4)	87%(13)	100% (7)	0	
Retreatment	46.3% (40)	27% (3)	13% (2)	0	0	
Endodontic surgery	6.5% (6)	27% (3)	0	0	33% (1)	

In some of the technical reports examined, it was noted that some patients complained about incompleteness of information supplied to them with regard to their treatment or the complication supervened. However, insurance experts evaluate professional misconduct according to the technical features of the endodontic treatment, thus marginalising the aspect of information supplied as an unsettling criterion. The determination of whether appropriate information was supplied to the patient is not subject to the judgment of an expert witness and remains a prerogative of the judge/court.

From a medico-legal point of view, thorough and complete clinical documentation is vital in establishing the correct judgment of professional conduct and proper evaluation of damages, as assessed with respect to the pre-existing clinical condition of the patient. During the management of malpractice cases by an insurance company, the dentist that performed the endodontic treatment is typically required to provide all available documents relating to the case (the patient's file, X-rays before, during and after endodontic treatment, etc.). In this study, incomplete, improper or totally absent clinical documentation was apparent in approximately 55% of the cases examined.

DISCUSSION

The opportunity for dentists to subscribe to a professional liability insurance policy, specifically provided by ANDI, has yielded high rates of appreciation inasmuch as it has been adopted by 50% of ANDI members as at 2012. The most appreciated features of such an insurance policy are the coverage of risks, the fact that it is suitably tailored to dental practice and the systematic involvement of dentists in the role of insurance advisors, to whom the members are encouraged to refer for explanations and suggestions, in an effort to avoid or to limit the negative effects of litigation on all parties involved. As suggested by Hapcook[4], the possibility for the dentist to discuss any untoward incident with a consultant from the insurance company may mitigate or even prevent escalation of the dispute. In the pilot phase of the ANDI insurance initiative, widespread adoption of their insurance policy was hindered by the fear of a breach of confidentiality occurring within the association, and that the subscribing members would be known and recognisable by the association board itself and by the colleagues appointed by ANDI as insurance experts. These concerns were rapidly demonstrated to be unfounded and ANDI members have become more confident in the policies with the result that the number of contracts has increased dramatically in the last 5 years.

From the general sample of claims registered by the ANDI Insurance company from 2006 to 2010 we selected 117 cases of endodontic malpractice to identify the main characteristics of the claimants and their practitioners, the most frequent endodontic errors that lead patients to seek compensation and the damages claimed or awarded as a result of the alleged misconduct. The results of our research revealed a tendency for young female patients to claim against older male dentists. In this respect, our results were highly consistent with those reported by Givol[7], who reported that female patients were more likely to lodge complaints against male dentists' treatments. Further, they are consistent with numerous previous reports that suggest the male dentist/female patient relationship is the most highly prone to a claim for negligence[3,5,12]. Hall *et al.*[13,14], Levinson *et al.*[15] and Roter *et al.*[16] demonstrated the significance of patient–dentist communication in the increase in litigation cases and indicated the relevance of a gender bias in professional communication patterns. Levinson *et al.*[15] and Roter *et al.*[16] also found that female dental practitioners adopt more patient-focused communication, and highlighted the potential importance of this in decreasing the risk of litigation.

The results of our research are consistent with numerous previous reports, but the collective evidence relating to gender influence on dental litigation is far from complete in resolving this issue[7]. This is at least partly because of a lack of data relating to the percentages of dentists who practise endodontics. This, and all the other studies, consider only the overall ratio per gender of general practitioners but not the percentage of male/female professionals who officially practise endodontics; this statistic would be needed to definitively conclude that male endodontists are more likely to be sued by female patients. Furthermore, our research lacks information relating to the overall ratio of male to female patients who undergo endodontic treatments; hence, any conclusions on the influence of patient gender on the pattern of dentist/patient litigation can be drawn only tentatively.

The most conclusive result that emerged from our study was that in 97.5% of the cases the endodontist was found guilty and compensation was then awarded by the dental experts appointed by the insurance company. Conversely, Bjorndal and Reit[5], reporting the judgments of the Danish Dental Complaints Board, found just 179 verdicts of negligence and 213 verdicts of non-malpractice in the period 1995–2002. The high discrepancy results may be explained by the heterogeneity of data examined in our study in comparison with that of the data examined by the Danish authors, and by the different types of claim managed by the insurance companies. In Italy, claims for compensation submitted to the dentist's insurance company

have generally already been structured and prepared by a second party on the basis of their opinion of the appropriateness of the disputed treatment, medico-legal expertise and eventually the intervention of a lawyer. This procedure possibly imparts a degree of selection bias by favouring 'well-founded' cases and eliminating many unfounded or frivolous claims before extended litigation.

The percentages of technical dentistry errors suggested by our research were consistent with those reported by other authors. Notable exceptions were the data concerning root canal underfillings, which were more frequent in our study than is suggested by the literature, and the fracture of endodontic instruments, which, conversely, were less frequent. In this study the percentage of teeth for which extraction was recommended was only slightly lower than the percentage of preservable teeth (46% after endodontic retreatment; 5.6% after endodontic surgery). We cannot conduct any comparison of our results with the literature with regard to the type of damage caused by endodontic misconduct because analysis of this issue is lacking in otherwise similar studies.

In the case of non-preservable teeth, endodontic misconduct involved the loss of a fixed prosthesis in 50% of the cases examined in this study, which markedly illustrates the potential complexity and extent of damage, and any subsequent compensation. It is well known that in most cases the dentist now prefers to extract the endodontically mistreated tooth and substitute it prosthetically rather than trying to retreat it. Possibly, a lack of scientific evidence relating to the possible evolution of periapical lesions in root-filled teeth, various uncertainties regarding the criteria to address a retreatment and the difficulties involved in accurately predicting long-term success impinge on the evaluation and adoption of therapeutic alternatives[9,17–29].

As this study was limited to the analysis of technical reports from dental consultants, and no associated clinical documentation was available, there was no opportunity to objectively reassess alleged misconduct or the extent of damages. We can, however, reasonably exclude the possibility that the insurance advisors were biased towards exaggerating the misconduct or overestimating the damage (for example, by deeming a tooth to be unrecoverable when it was not). In contrast, the higher costs of compensation for tooth removal than for endodontic retreatment would have facilitated realistic percentages of the occurrence of malpractice and an accurate incidence rate of unrecoverable teeth.

The discrepancy between the total number of cases examined compared with those that went to court (17% of the cases examined in this study went to court) leads us to believe that endodontic malpractice claims are most often settled with an out-of-court resolution. It is plausible that most of the deviations from the standards of endodontic care are quite recognisable if a complete record and proper radiological documentation exists. For this reason, the parties involved (including the insurance company) may prefer to settle disputes out of court, saving time, money and psychological stress, before the claim proceeds to a full civil action. Conversely, If an issue of poor record keeping affects the case, the possibility for the dentist to disprove their liability when an accident or a complication occurs may become difficult. Similar to the results reported by Rene and Owall[3], in a remarkable percentage of our case sample (55%) no appropriate clinical record could be found, thereby jeopardising the ability of the dentist to deal with the claim and to support their advisor and the insurance company in providing the best defence of their conduct.

Because all the cases examined originated from a negative endodontic outcome, in similar cases, according to Italian civil law the dentist has the burden of disproving their liability by proving that the treatment they administered met the appropriate standards of care. However, how can a dentist disprove their liability if no radiographs have been generated or have not been kept during the endodontic diagnosis, planning, and root therapy, as is commonly recommended by the endodontic guidelines? A negative outcome owing to a simple complication, in conjunction with absent or incomplete documentation, can therefore lead to a judgment of liability even in cases that possibly were not affected by any technical errors.

CONCLUSIONS

The endodontic malpractice cases claimed in Italy are more often resolved in out-of-court settlements because the different parties involved choose to resolve the dispute as soon as possible to save further financial burden, time and emotional stress. The data from insurance companies are very seldom made available but it would be extremely useful to learn the real occurrence statistics and trends of malpractice claims for the different dental disciplines. Dentist–patient communication emerged as a parameter of utmost importance in avoiding or lessening the likelihood of litigation. Our data are consistent with those of other studies that have indicated the relationship between patient and dentist may be subject to a gender bias, but further studies are needed to address this point further.

Root underfilling was the most frequent endodontic error, and loss of the tooth and the application of a prosthesis in place of the mistreated tooth was the most frequent consequence of that. From a medico-legal

point of view the lack of proper documentation emerged in a high percentage of cases, affecting any possible discharge of liability by the endodontist. A very high percentage of endodontic claims are settled in an out-of-court resolution and this is a clear demonstration of the importance of a custom professional liability policy for dentists and continual communication with a dental insurance expert, especially after the unfortunate event of litigation has commenced and during the management of this litigation.

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Conflict of interest

Nothing to declare.

Ethics statement

The Authors declare that the present research has been conducted in full accordance with the World Medical Association Declaration of Helsinki.

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