VIEWPOINT

Orthodontics—Guilty until proved innocent: How do we plead?

or

What kind of orthodontics may we practice?

Peter S. Vig, BDS, PhD, D. Orth., RCS(Eng.), FDSRCS(Eng.)
Ann Arbor, Mich.

The time is past when society accorded doctors unquestioning respect and trust in deference to those whose knowledge, skill, and altruism were beyond question. Despite remarkable advances in biomedical research and technology that today make commonplace what only recently would have been considered miraculous, the concerns of society with the cost of health care overshadow other considerations. There have been drastic and rapid changes in the socioeconomic environment within which we function. The effects are not confined to orthodontics but affect most clinical fields, and are manifested to a greater or lesser extent globally. Perhaps it is attributable to the rapidity of this change, which has occurred within the practicing lifetime of the majority of health professionals, that we appear to be ill prepared to cope with challenges that have no historical precedents in our experience. For most of us, our education and subsequent patterns of practice were shaped by factors other than questions of supply and demand, professional accountability, or considerations of the utility of competing clinical alternatives. Given that societal expectations have changed—for example, where "informed consent" is concerned, we need to rationally evaluate present circumstances and learn as much as we can about our level of performance and the reasons for any discrepancies between our "worth" as perceived by us and by others.

Although we may not be accustomed to having our worth questioned and our first reaction may be indignation, it is to be expected that orthodontics, like other health services that deal with treatments of elective and nonfatal conditions, will be subjected to pressure. The society in which we live is not motivated by malice but does have a collective self-interest that molds public opinion and ultimately determines policies that elected legislators deem to be in the interest of the majority. Although it is possible to argue that not all legislation devised to conform to public opinion is actually in the public's long-term interest, it is nevertheless a fact of life, particularly in a democracy, that such forces do exist. That is why monopolies are not favored either by governments or public opinion. It is assumed that increased competition invariably leads to lower cost per unit of value provided. Without the expertise in economics, it is difficult for the layperson to establish the validity of this assumption as a viable generalization and hence to assess the appropriateness of such regulatory legislations in the world of business. The extension of such argument to include clinical specialties and their treatments as targets for cost cutting by increasing the supply side of the "market" may appeal to public opinion but neglects to consider the value of treatment, and possibly incorrectly assumes that cost will decline, risks will not increase, and benefits of treatment will be constant, irrespective of who the providers may be. It is admittedly a biased view, but even without any data, I suspect that on average treatment provided by well-trained and experienced orthodontists as opposed to nonspecialists has a higher probability of (1) attaining the established goals, (2) being completed in a shorter time, (3) resulting in a greater correction of all the salient features of malocclusion as measured by any objective criterion, and (4) costing no more than nonspecialist treatment.

Unfortunately these propositions are as yet only untested hypotheses. However, the good news is that hypotheses of this type are not only testable for orthodontics but have already been proposed and examined in the general field of medicine, with the result that at

least some aspects of clinical practice can be unequivocally claimed to work better than others and that some options do provide better value than others in terms of cost-benefit. In other words, opinion can be replaced by fact and the efficacy of different treatments may be objectively compared through well-established methods that are available to us. It seems that unless we can, and do, produce evidence to the contrary, we are considered to be guilty until proved innocent! Of course it is useful to know what form the "guilt" takes and how and by whom we are accused.

Today the fates of nations are inextricably linked. Few would dispute that our economy is sensitive to events that take place around the globe.

A recent, and possibly for us significant, event has passed without comment from most orthodontists in the United States, and quite probably without their knowledge. In 1986, the British government's Department of Health and Social Security (DHSS) published a "Report of the Committee of Enquiry Into Unnecessary Dental Treatment."[1] Although the Committee was established to review all aspects of dental treatment, their specific conclusions and recommendations relative to orthodontics should be of some interest.

Although we do not have a National Health Service such as Britain's in which the "third party" is the government, it is evident that both fees and the standards of service can be regulated by forces beyond the control of specialists or their patients. The juxtaposition of two examples of how this occurs, both abroad and here, is not intended to evoke indignation but should serve to enlighten. If the orthodontic specialty is to retain the privilege of establishing and maintaining its standards, some constructive policies based on objective appreciation of the pertinent issues must be formulated. This communication is intended to identify some of these issues and possibly promote discussion and action.

Commenting on the nature and extent of unnecessary treatment, the report states, "Some of those who gave evidence did not differentiate between deliberate unnecessary treatment and unnecessary treatment caused by an out of date treatment philosophy." Although the cost of orthodontics accounts for only 2% of the total cost of all dental treatment, the report devotes considerable attention to the possible abuses and questionable benefits of orthodontics. It states, "We are particularly concerned about orthodontic treatment. . . . Furthermore, there is considerable room for argument as to what dental anomalies amount to disfigurement." They cite a study by Shaw and associates[2] of the dental and social effects of malocclusion and the effectiveness of orthodontic treatment; these authors ". . . concluded that there is little direct evidence that dental irregularities will consistently be associated with poor dental health . . . and that . . . individuals with other than extreme cosmetic oral defects will be unlikely to have serious emotional difficulties." It is admitted in the report that the question remains to be fully investigated. But despite this proviso, the Committee members ". . . are concerned that much unnecessary and costly treatment may be taking place and this may be in part caused by the treatment philosophy of some of those undertaking orthodontics."

The Committee's conclusion is worth quoting in full: "In the light of the above evidence we consider that there is need for research into the extent to which orthodontic treatment should be provided under the NHS. We recommend that: *the DHSS should consider with the dental profession what orthodontic treatments can be justified in terms of their effects on dental fitness.*"

It is noteworthy that this Committee was set up in response to public concern following press reports and television programs about certain very high earning dentists and anecdotal evidence of unnecessary treatment, in particular a Granada TV *World in Action* program broadcast on June 25, 1984. From the available documentation, the inquiry was conducted in a fair and thorough manner. Evidence was gathered from the research literature and foreign countries including the United States and Canada, and testimony was obtained from representatives of the dental profession at large and from specialty organizations, including orthodontics.

What then are the inferences to be drawn from their conclusions? There are some that come to mind as being shortcomings of orthodontics as a clinical science and that may feasibly be remedied or at least ameliorated.

1. Significant differences in treatment philosophies exist among those who provide orthodontic treatment. This in itself is neither news nor necessarily bad. It is, however, a problem when the merits of such philosophies have not been evaluated by objective means. For in such circumstances, there is a tendency to accept the new in preference to the old simply because in the material world of perishables or passing fads, "new" is good and "old" is bad. A critical evaluation of the rationality and utility of treatment principles should be less a matter of taste and have more of a basis rooted in appreciation of the development of ideas and the objective estimation of their practical application. More than a few of the so-called new ideas in orthodontics

are old indeed and are simply revived by enthusiasts who may be unfamiliar with the reasons for the demise of such treatment "philosophies" through their empirical rejection by an earlier generation of clinicians. (Why indeed did it take two generations for the Herbst appliance to be reincarnated?)

2. *The need for treatment cannot be objectively defined or determined.* This being the case, can it be determined that demand is not generated by providers but by the desires or needs of the patient population? This is a crucial issue when it comes to deciding whether orthodontics is a health service or merely a service industry. In this context it is folly to justify treatment need on the basis of currently hypothetical associations between various orofacial relationships that we can change and other health benefits for which we cannot yet take credit. At present we need to exercise considerable caution and reservations when it comes to making any claims for cures in conditions such as obstructive sleep apnea, facial pain, or TMJ conditions of unknown cause. The sporadic or episodic nature of these and other conditions is such that remissions may in some instances be expected to occur, and by the laws of probability these may coincide with some type of treatment. Hence without appropriate controls, clinicians who seek new cures and have conscious or unconscious bias may be deluded into erroneously concluding that they have in fact developed a successful remedy. It is not bad manners to be skeptical of new claims stating that "in my hands" or "in my clinical experience" it works! Is it not preferable to discover that the emperor has in fact no clothes than to follow suit and find ourselves caught with our pants down? Failure to require proof is simply acquiescing to the addition of yet another item of dogma that contributes to a shifting of the acceptable standards of treatment from the tested to the speculative. This process becomes increasingly difficult to reverse because in time those who promote the new treatment will surely publish anecdotal success stories and may even construct logical theories, possibly based on false premises, to explain their chance findings. Each additional publication increases the "volume of evidence" and seems to lend credence to whatever is appealing and well sold. Although many fads arise and some are short-lived and replaced by others, neither in our literature nor in the continuing education brochures does there apear any evidence that clinicians who have tried a previously well-endorsed method have rejected it because it failed to live up to the claims of its promoter. It certainly would be refreshing to see the occasional article with titles such as "Empirical Rejection of the Whizzbangator After 5 Years of Clinical Frustration: Unpredictable Treatment Response and Low Success Rate," or "Inprecision and Low Sensitivity of Diagnostic Method X: A Refutation of My Previously Endorsed Procedure."

3. *In the absence of data on treatment outcomes for any of the currently accepted treatments, but with known cost and possible risks, orthodontic treatment is perceived as having an unacceptably high cost/benefit ratio.* The remedy for this perception is surely self-evident. Estimates of the utility of treatment and alternative methods are possible. The results of such studies could do much for the profession and the public we serve.

It is a fundamental tenet of justice, particularly in legal systems that derive from the British tradition, that the accuded is presumed innocent until proved guilty. Hence the onus of proof is on the prosecution who must establish guilt beyond a reasonable doubt. Although justice and truth are by no means synonymous, adherence to this tenet does reduce the risk of persecution and wrongful or malicious conviction and punishment. The corresponding tenet in science is the test of an assertion of some verifiable proposition expressed as a hypothesis. By common consent and for rational reasons, hypotheses are never accepted as proved beyond a shadow of doubt since all experimental methods applicable to such tests are imperfect and may be subject to unknown bias or other flaws. For this reason hypotheses can only be refuted but never proved. However, the sequential refutation of untenable hypotheses is the route by which science progresses toward establishing the most reasonable explanation of observed facts.

Orthodontics is a profession that is supposed to be based on science, but it also represents a service that is provided in a socioeconomic context as a contractual exchange between providers and consumers. Not to put too fine a point on it, orthodontic practice is a business endeavor. Strictures imposed by "truth in advertising" apply, as do those legislative dictates that pertain to standards of competence, negligence, and so forth.

Whether those who "judge" sit in a court of law or occupy a scientific position within an academic setting, orthodontics should meet criteria for acceptability in both settings, whenever and for whatever reasons it is under scrutiny. This is right and proper as long as the rules of legal and scientific investigation are equitably applied. If not, this duality of science and business has the potential for placing clinicians in all health professions in a position of double jeopardy. We are well past the time when orthodontists might be accused of paranoia if they questioned the future survival of their specialty. The monopoly of orthodontic specialists as the

providers of treatment has already become a thing of the past. If this were the worst news, things could be worse. However, the fact is that things *are* indeed much worse!

At the most basic level, the real issue at stake is who will be the arbiters of orthodontic standards? Who will determine what is good or bad, what criteria will be used to define competence or negligence, and how to select between the valid (rational) and spurious (irrational) when it comes to the scientific rationale of orthodontics? This issue is no longer a topic of concern confined to the philosophically inclined eggheads, but is one that already determines the outcomes of litigation and will no doubt increasingly influence all aspects of education and consequently of practice.

If one looks closer to home, the picture is no brighter and gives little cause for complacency. Recently the TMJ Institute of America circulated an advertisement for a course with the unpretentious title of "TMJ Summit." For $575 it is promised that we will learn "what you need to know about TMJ today." There is even a guarantee: "Everything we claim and more is guaranteed. If you believe our promises have not been fulfilled, you can get your registration money back in full." Such extravagant claims rarely are made by reputable academics and never by scholars whose assertions are under the scrutiny of others competent to judge the scientific merit of research. If nothing else, a formal scientific training does equip one to differentiate between that which is based only on the volume of opinion from that which is based on the weight of evidence. Hard data and statistically validated associations do not require editorial hyperbole.

The plethora of such "continuing education" brochures, which constantly inundate us, may have blunted our senses sufficiently to dismiss this as yet another in a long series and therefore one not to be taken too seriously. However, there are some features that make this intriguingly different. In addition to clinicians teaching that "Traditional orthodontic standards have been made obsolete by what we know about the TMJ today," the participant also is promised that he or she will learn why upper incisors should not be retracted and why the extraction of premolars is a high-risk procedure. Such assertions, particularly when emanating from a malpractice lawyer rather than from a mere orthodontist, surely lend credence to the proclamation in the brochure stating that "The standard of care in orthodontics has changed. The orthodontic departments in dental schools no longer determine the standard of care in orthodontics." If such assertions are ignored, then they surely will become true and are merely self-fulfilling prophecies. The fulfillment of such a prophecy would most assuredly mean the demise of orthodontics both as a profession and a science, and would relegate it to the status of a trade or business with ethical standards no more stringent than those expected from used car dealers.

What then are the charges brought against orthodontics, what is the prosecution's evidence, and most important, what is to be the defense? The indictment states that it is culpable to extract premolars, retract upper incisors, or use headgear since maxillary excess is a myth. This clearly implies that indiscriminate or arbitrary expansion, and the advancement of the mandibular dentition (with or without the mandible) are the proper goals of orthodontic treatment. It further implies that such goals are both clinically and biologically appropriate, predictable, consistently attainable, and generally stable. All this aside, it also makes the untested assumption that there exists a proven cause-and-effect relationship between any given orthodontic treatment protocol and the prevalence of TMJ or facial pain symptomatology. There is absolutely no valid evidence to support any such explicit or implied contentions. In the absence of any data, why is the onus of proof on "traditional" orthodontics rather than on those who profess the new dogma?

One is left wondering if the new expansionists have ever heard of Charles Tweed or others who systematically observed the long-term stability of ill-advised nonextraction treatment. It also would be interesting to learn on what basis the concept of dentoalveolar equilibrium relative to the oral muscles has been dismissed as being irrelevant both in the cause of malocclusion and for the long-term prognosis of treatment.

As yet there is no objective evidence that "functional orthodontists," that is, those who routinely incorporate functional appliances in their treatment or use such appliances exclusively, can produce results that are as good as those obtained by other means. Until the efficacy of a method is systematically tested, it is improper to claim parity, let alone superiority to existing alternatives. Not only is this self-evident, but such controversies are a major preoccupation of clinical epidemiologists whose techniques have yet to be applied to any orthodontic dogma, old or new. Until appropriately designed studies exist, it is clearly possible to make unassailable claims for any point of view. For instance, if a cephalometric analysis with built-in bias is selected, it is entirely possible to demonstrate that a remarkably high proportion of the human race is endowed with mandibular deficiency and that maxillary excess or protrusion is a rarity. Such a premise serves well those who promote patented functional appliances to grow mandibles, rather than having to bother with differential

diagnosis, not to mention the additional chores associated with the techniques of precise, controlled tooth movements in three planes of space. If adherents to the strictly "functional" mode of treatment surveyed the research literature, they may be surprised to learn that the components of a Class II correction are in fact remarkably similar whether functional or fully banded appliances are used.[3] Both comprise upper incisor retraction and "headgear" effects.

One could go on and on refuting each accusation in the indictment; it is perhaps even possible to demonstrate that the nasion-perpendicular-to-Frankfort plane analysis is not fit for human consumption, or that the prevalence of TMJ symptomatology is not associated with orthodontic conditions or their treatment. Unfortunately NIH and other funding agencies assess research grant proposals on their scientific merits and are disinclined to support research prompted by such questions as, "When did you stop beating your wife?" We should perhaps stop to think how and why so many questionable notions have gained acceptance and such surprising credence both within and on the fringes of orthodontics. Few will disagree with Laskin[4] who makes a plea for specialties to establish standards, and all responsible specialists regret the consequences of FTC actions and the "85,000 new orthodontists" referred to by White.[5] Unfortunately, and especially in today's climate, such statements will be construed as further "evidence" of self-interest by a declining monopoly. More to the point, it is doubtful in the extreme if, based on what we currently know and the diversity of subjective opinions within our profession, any consensus within orthodontics is achievable, as recommended by Laskin. There are fundamental issues concerning the rationality of orthodontics that have yet to be addressed,[6] but this is unlikely to be done by any but those with the appropriate academic background.

It is necessary to consider whether Shakespeare may have had a point. Is it possible that "The fault . . . lies in us and not in our stars?" Or perhaps our fault is that we have indeed hitched our destiny to the wrong "stars." The glittering prizes of stardom have certainly been conferred somewhat indiscriminately on numerous "clinician-scientists" whose claims have been subjected only to uncritical paying customers in the continuing education industry or in those publications that care more for circulation than scientific respectability. If one looks dispassionately at the pattern of practice overall, it is difficult to argue that in recent years departments in dental schools have influenced orthodontics as much as the fads and fancies that have been promulgated for profit.

"Agonizing reappraisal" may sound like a cliché, but could be appropriate to describe what orthodontics must undertake if it is to put its house in order and survive today's challenges. A certain amount of "agony" is inherent in questioning the very foundations of well-established beliefs, particularly those that bear on how we practice or what we believe and teach. However, unless we are willing to impose on ourselves the responsibility for the rigorous and continuing evaluation of the standards of care and the rationality of orthodontics, we surely will be subjected to arbitrary and perhaps quite unjustified criticisms. If nothing else, we should have learned that the burden of proof for what constitutes good orthodontics is ours because no one else can be as well qualified or motivated to do the necessary work.

Peter S. Vig, BDS, PhD, D. Orth., FDSRCS(Eng.)
Professor of Dentistry
Department of Orthodontics and Pediatric Dentistry
School of Dentistry
The University of Michigan

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