The loss of teeth is still traditionally seen as an inevitable part of the ageing process. In this context oral rehabilitation has the capacity to satisfactorily restore function by the replacement of all lost teeth according to anatomical norms. However, recent clinical studies have found that oral and systemic health and indeed quality of life or patient’s satisfaction do not specifically depend on the presence of a full complement of teeth (Elias & Sheiham, 1998). It has been observed that a large proportion of middle-aged and elderly patients are satisfied with their oral function even after molar loss and that the retention of solely the anterior and premolar teeth may be sufficient to satisfy the aesthetic and functional requirements of the majority of elderly patients.

Clearly the loss of a large number of teeth or ill fitting or inadequate dentures can have some degree of impact on quality of life, but limitation in chewing may not always be as readily apparent to the patient (Agerberg, 1988). The ‘shortened dental arch’ (SDA) represents a frontier between what is healthy/comfortable and pathological/uncomfortable for most middle-aged and elderly people (Figure 1).

Active patient involvement in clinical decision-making in conjunction with the use of accurate scientific information is one of the fundamental tenets of evidence-based health care (Adams & Drake, 2006), and therefore a patient’s opinion should be taken into account and combined with other factors i.e. preservation of oral tissues, systemic status and cost. The maintenance of a SDA may prove advantageous in terms of preservation and costs when compared with dental prostheses because it does not necessitate the preparation of abutment teeth, surgery or the fabrication of dentures. It is conceivable that alteration in the efficiency or any impairment of chewing may hinder digestion which in turn may have a compounding effect on general health. However, chewing impairment may only have a limited effect particularly as modern diets are based on foods with a soft consistency. Even foods which are less readily digestible require less than 30% of the masticatory performance of a completely dentate subject (Farrell, 1956). Providing that partial edentulism does not influence food selection it should not be considered a significant cause for systemic health problems (N’gom & Woda, 2002).

Although this concept arose in developed countries, it is equally valid for populations in developing countries i.e. diets and cultures are variable. A study carried out in Tanzania of 725 participants with different permutations of the SDA compared 125 participants with complete natural dentition (Sarita et al., 2003). It was found that although some loss of function occurred after the loss of molars the...
forms to the following principles (Ash & Ramfjord, 1995):

1. Absence of pathological processes;
2. Satisfactory function – mastication, swallowing and speech;
3. Variations of form and function;
4. Ability to adapt to structural changes.

Hence if a patient lacks occluding molars, has adequate function, no progressive shifting of teeth, no subjective complaints about lost teeth and pathological changes are unlikely to be caused by this type of partial edentulism, why should dental prostheses be provided? Ethical concerns may also include the costs associated with unnecessary provision of removable partial dentures, fixed dentures and implant supported prostheses and it could be argued that for this specific case, that the best dentistry is probably “no dentistry” (Sheiham, 2002).

The majority of participants were able to adapt adequately. The retention of anterior teeth, premolars and a pair of occluding molars (such as, 16 and 46) can provide satisfactory masticatory function. In general, Brazilian people have illustrated their satisfaction with SDA schemes; good results were achieved with the preservation of anterior teeth and three pairs of occluding premolars. Moreover, in the majority of participants the SDA approach proved to be more satisfying than the replacement of lost teeth by removable partial dentures (Elias & Sheiham, 1999).

The loss of teeth has also been implicated as a possible cause of temporomandibular disorders (TMD) with the expectation that these disorders would be more prevalent as a consequence of the loss of posterior teeth. An observational study found an association between missing teeth and articular pain (Ciancaglini et al., 1999). However, the association was discrete and insignificant for participants with a small number of missing posterior teeth. It can be reasonably assumed that TMD, as with nutritional problems, is associated only with extensive loss of occlusal support. Clearly, the stomatognathic system is capable of adequate function if premolars and anterior teeth are present, but further shortening might be associated with orofacial pain (Budtz-Jorgensen et al., 1985).

The association between the number of teeth in occlusion and signs or symptoms of TMD has not been confirmed by all investigators (Meijsjjo & Carlsson, 1984) which appears to indicate that occlusion may only be a peripheral factor in the etiology of TMD. A clinical trial by Witter and colleagues (Witter et al., 1994) showed that the loss of molars is not a risk factor for TMDs. This appears to confirm that the absence of molars is not relevant to the development of muscular and joint TMD, as long as the insertion of removable partial dentures was not able to prevent TMDs in part of the sample. It can be concluded from this report that the return of molar support was similar to no intervention if we consider the prevention of TMD as the desired effect. It would be safe to assume that the participants would be most likely to develop TMD regardless of the presence or absence of molars.

Clearly the stomatognathic system does not need to adhere to the “criteria for ideal occlusion” for being physiologically acceptable, providing it conforms to the following principles (Ash & Ramfjord, 1995):

1. Absence of pathological processes;
2. Satisfactory function – mastication, swallowing and speech;
3. Variations of form and function;
4. Ability to adapt to structural changes.

Hence if a patient lacks occluding molars, has adequate function, no progressive shifting of teeth, no subjective complaints about lost teeth and pathological changes are unlikely to be caused by this type of partial edentulism, why should dental prostheses be provided? Ethical concerns may also include the costs associated with unnecessary provision of removable partial dentures, fixed dentures and implant supported prostheses and it could be argued that for this specific case, that the best dentistry is probably “no dentistry” (Figure 2) (Sheiham, 2002).

Dental practice has previously been guided by mechanical concepts and there was a widespread belief that only the rehabilitation of former occlusal morphology would provide ideal conditions for our patients. This was called the “28 teeth syndrome” and in the majority of situations is inappropriate (Käyser, 1989; Owall et al., 1997). The search for such an occlusal scheme underestimates the adaptive ability for each patient. As an example of adaptation, it was found that the loss of molars results in controlled incidence of force by the masticatory muscles and overloading of the TMJs does not occur as a consequence (Hatorni et al., 2003). This illustrates the physiological potential for adaptation of the stomatognathic system. If the human body adapts itself after surgery or trauma by means of complex mechanisms, it would be naïve to think that oral health would not adapt itself to the damage imposed by the loss of occlusal support. The SDA concept can be justified by this premise, as it summarizes a successful response by the stomatognathic system to adverse factors.
References