INTRODUCTION

Manual dexterity is equally important for both the dentist and the patient. Patients with limited manual dexterity are compromised due to their inability to practice the necessary oral and prosthesis hygiene measures.

The average age of the world’s population is increasing rapidly. The “graying process” presents new opportunities and new challenges for improving the oral health of the elderly, particularly those afflicted with neurocognitive and manual impairments. The dental problems associated with these conditions include but are not limited to a decrease in oral hygiene; difficulty in controlling and retaining dentures; xerostomia. Parkinson’s disease and Alzheimer’s disease are the most prevalent type of progressive neurocognitive impairing illnesses, affecting millions of elderly Americans. Rheumatoid arthritis (RA) or rheumatoid disease was one of the first multisystemic disorders to be considered an autoimmune disease that causes chronic inflammation of the joints and probably limits the patient’s manual dexterity. It is estimated that arthritis and other rheumatic conditions affect 42.7 million Americans. Medical complications due to RA and its treatment can affect oral health care. Oral health care providers need to recognize and identify modifications of dental care based on the medical status of patients with RA. Furthermore, oral health care providers play an important role in the overall care of these patients as it relates to early recognition, as well as control of the disease. While rheumatoid arthritis is a chronic illness, patients may experience long periods without symptoms. Typically, however, rheumatoid arthritis is a progressive illness that has the potential to cause joint destruction and functional disability. The disease causes deformity of hand and feet. Fingers are recognizably gnarled and have bumps, called nodules with nearly fused wrists. Things that most people take for granted for example sleeping, bathing, brushing your teeth, getting dressed, making meals, and even driving a car are extremely challenging.

In oral surveys, there are no significant differences between RA-patients and non-RA patients in terms of percentage of edentulousness and number of remaining teeth. However, removable partial and complete dentures are considered less satisfactory among RA subjects. Disorders related to the TMJ occurred much more frequently among RA-patients than among non-RA subjects.

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ABSTRACT

Degenerative functional and neurocognitive disorders with limited manual dexterity are becoming more prevalent as life expectancy is improved. Although the use of a removable partial denture is widely accepted treatment modality, the clinician should recognize the indications and maintenance requirements of different designs for individual patients. The planning and limitations of such treatment in patients with limited manual dexterity were presented.

Key words: Rheumatoid arthritis, Degenerative disorders, Neurocognitive disorders, Manual dexterity, Framework design.
As the adult population increases, a greater number of patients with these diagnoses will require dental care. Dental providers need to be aware of the special problems associated with the treatment of the older healthy subject and the neurocognitively and functionally impaired patient. Poor patient memory, musculoskeletal disorders, unpleasant side effects of medications and a lack of social support are among the physical limiting factors.

Treatment outcomes may be improved by utilizing dental implants, which tend to succeed in older adults in the same manner as in younger adults. Use of implant-supported mandibular overdentures for edentulous patients with Parkinson’s disease has been reported in the literature with satisfactory results. For patients with Parkinson’s disease and with limited manual dexterity, the attachment system should also allow easy insertion and removal of the prosthesis and cleansability around the implant abutments. The clinician must be aware of the physical, metabolic, and endocrine changes associated with aging and how these changes may affect implant treatment. The elderly deserve the best care the dental profession can offer. However, elderly persons tend to give dental care a lower priority than medical care.

The following clinical report describes the treatment planning involved for the use of a precision attachment for a maxillary removable partial denture in patient with limited manual dexterity.

**CLINICAL REPORT**

An 83-year-old man was referred to the dental school of the University of Michigan, Ann Arbor complaining of difficulty in placing and removing the maxillary removable denture. Also, he mentioned: “My tongue keeps playing with the hole in my palate”. The existing maxillary removable denture had been fabricated 6 months before, but the patient was unable to place and remove it easily. He was diagnosed with chronic rheumatoid arthritis and had had a mild stroke approximately a year earlier. Medication was prescribed by his physician for the two conditions, and he was medically stable. However, the disease has caused deformity of hands with fingers’ nodules (Fig 1).

On examination, the patient presented with good oral health. He had Kennedy Class II maxillary removable denture with two precision attachments at the metal ceramic crown #13 & #26 (Fig 2). All the remaining teeth were satisfactorily restored with fixed partial dentures (Fig 3). The denture extensions, occlusion, and occlusal vertical dimension were satisfactory. The patient was asked to insert and then remove the denture and the time needed was recorded. He expressed difficulty with average 2 minutes to insert it and 7 minutes to remove it without extra help.

It was recommended to the patient to remake the removable denture with modified design and with the utilization of the old attachments to cut down cost (Fig 4). Modifications included the following:

1. Coverage of the palate by utilizing the mid-palatal strap.
2. Addition of minor connector and mesial rest on tooth #24 and circlent clasp and guiding plate lingually and distally to tooth #27. These are to serve as guiding plates during insertion. The buccal retentive arm is easy to catch by finger.
3. A small old condenser was modified to serve as hook-shaped tool for removing the denture by the patient (Fig 5). The patient practiced inserting and removing the metal framework with no difficulty encountered.

The removable denture was then constructed following the usual universal protocol (Fig 6 & Fig 7). At the delivery visit, the denture function was satisfactory and the prosthesis could be inserted and removed by the patient without assistance. During a 12-month maintenance period, the patient was satisfied with the functional improvement achieved by the modified prosthesis.

**DISCUSSION**

Dentists should be prepared to manage the oral health needs of elderly clients who are afflicted with complex medical, functional, and dental disabilities. Proper dental management requires a commitment to provide treatment of quality despite myriad obstacles. From the outset of evaluation, there must be recognition of the likelihood of compromised self-care and the...
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Fig 1. Hand defects due to rheumatoid disease.

Fig 2. Old maxillary prosthesis.

Fig 3. Mandibular teeth.

Fig 4. Maxillary metal framework.

Fig 5. Modified small condenser to be used as a denture removing tool.

Fig 6. Interocclusal record after patrix connection using jet acrylic.

Fig 7. Finished prosthesis in the patient mouth.
development of proactive strategies to address dependence in oral care. For the older patient, the dentist must go beyond the oral cavity in assembling the battery of information on which a comprehensive plan of oral care is based. Through identification of diagnoses, their pharmacologic managements, and related polysystemic functional limitations, the dentist gains insights into potential treatment pitfalls and the patient’s ability to contribute to different facets of care. Potential misunderstanding can be avoided and patient orientation enhanced through early identification and involvement, as appropriate, of the decision maker and other interested parties. When all pertinent clinical data are gathered, the provider needs to work with the patient to establish the plan of care that best addresses the dental needs and the medical and functional limitations, given fiscal realities.

For a successful partnership with primary care physicians, it is very important that geriatric care managers should be knowledgeable in the principles of geriatric medicine. In-depth geriatric assessment provides directions to reverse or halt failure to thrive.

Three geriatricians describe an approach to comprehensive geriatric assessment that takes into account the multiple social and medical problems that affect the functional well-being of frail elderly patients. With a 45- to 90-minute time investment, clinicians can obtain an inventory of the factors that threaten an elderly patient’s independence and gain a fuller understanding of the patient’s complex needs.

These compromised patients should be evaluated by gathering data from a myriad of sources. The first important step is establishing a baseline. Using a functional health pattern tool (FHPT) developed and adapted from the North American Nursing Diagnosis Association in 1987, is one such method of constructing a database and formulating diagnoses. Another way is by assessing independence of and dependence on assistance from another person in cleaning, shopping, transportation, cooking, bathing, dressing, going to the toilet, transfer, continence and feeding and it is possible to classify performance according to an ordinal scale of ADL (Activities in Daily Life). Physical impairments and functional limitations had a considerable impact on dependence in daily life activities. Religious participation and involvement are associated with positive mental and physical health. Family life is the key to the health of elders specially older men. Lack of social support increases the risk of mortality and supportive relationships are associated with lower illness rates, faster recovery rates and higher levels of health care behavior.

Treatment planning older patients often becomes a complex process as dental professionals, patients, family, and caregivers attempt to prioritize and balance the influences of multiple age-associated dental, systemic, and psychosocial factors. To assist clinicians in identifying and weighing numerous factors that can influence planning dental care for older patients, clinicians should be wary of relying on chronological age as a factor, but should focus on the issues of biologic age and life expectancy, which may be greater than many older adults believe. The longevity of dental interventions is another factor that is helpful to consider in determining the most appropriate treatment plan for older adults. Among many issues influencing the treatment planning process, the quality of communication between clinicians and older patients is critical, along with the influence of third parties, including families and professional caregivers. Patients must be involved intimately in the decision-making process.

Dental caries is the major cause of tooth loss in elderly individuals with physical and mental disabilities. The diagnosis of caries in elderly individuals is difficult due to a complicated oral environment compounded by the prevalence of physical and mental barriers to care. The most effective strategy that the profession can take is twofold: thoroughly assess the level of caries risk of the elderly individual, and institute recognized measures of fluoride therapy commensurate with the defined risk. Since manual dexterity decreases with increasing age, the use of electric tooth cleaning devices and other aids for improving oral hygiene should be encouraged among the elderly. This is particularly so in patients with physical or mental handicaps. The Oral Hygiene Performance Test (OHPT) proved to be reliable and demonstrated construct as well as concurrent validity. It appears useful to clinicians in assessing the oral physical function of elderly patients with regard to their maintenance of oral hygiene. Because the OHPT is a direct-
observation instrument, it can even elicit higher functions in elderly patients.38

In most patients with RA, the condition will necessitate few or no changes in routine dental care. However, considerations include the patient’s ability to maintain adequate oral hygiene, xerostomia and its related complications, the patient’s susceptibility to infections, impaired hemostasis, and untoward drug actions and interactions. Such patients may require antibiotic prophylaxis owing to joint replacement and/or immune suppression, glucocorticosteroid replacement therapy and modifications in oral hygiene procedures. Intra- and extraoral conditions such as ulcerations, gingival overgrowth, disease-associated periodontitis and temporomandibular pathology also need to be recognized.2

The rising geriatric population remains dentate and requires more dental care to maintain dental health and function. Full consideration must be given to psychological and functional factors before treatment plans are formulated. Clinicians must learn to focus on functional status, in terms of both assessment and outcome, in their care of older patients.39, 40 In the presented case and similar scenarios, achieving the most secure foundation while simultaneously eliminating imperfections and incorporating a simple design that promotes good oral hygiene, easy handling and a natural and attractive appearance are significant contributors to the patient’s welfare.

SUMMARY

The patient’s manual dexterity should be considered during designing a case for cast base removable partial denture especially in neurocognitively and functionally impaired patients. A modified simple denture design should be proposed for such patients for easier insertion & removal and for proper oral and denture hygiene. A hook-shaped tool was designed to help in removing the denture.

REFERENCES

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