There are approximately 37 million fully edentulous people in the U.S. Several million more become edentulous each year. In a difficult economy the number of people who cannot afford dentures or who do not have easy access to care is continuously increasing. The effects of not having a functional occlusion directly impacts general health and overall health-care expenses. Lack of teeth increases the incidence of chronic disease in areas such as cardiovascular disease, gastrointestinal disease, obesity and diabetes. Not having teeth also affects quality of life, self-esteem and employability (Fig. 1).

Dentures have been made nearly the same way for more than 100 years. The traditional technique typically encompasses four to five dental office visits with laboratory time in between. The process generally takes about six weeks. Adjustments are often necessary which add more visits to the series of treatment.

The Larell One-Step Denture is an innovative alternative approach to complete dentures. There are many indications for its use in denture prosthetics. The Larell denture is an alternative technique offering several advantages: It is able to be fabricated in a single visit of one-hour or less, the technique is intuitive and easily learned, and no outside dental laboratory time is needed. For those patients who must travel distances or have difficulty with mobility, the ability to fabricate dentures in one visit is important. While traditional dentures are almost always made in the dental office, the one-hour denture is able to be made anywhere, includ-

**The Effects of Edentulism on General Health**

- Lack of Healthy Nutrition
- Increase in Chronic diseases
- Decreased Quality of Life
- Lower Self Esteem

Fig. 1: The effects of edentulism
ing nursing homes, assisted living residences, mobile dental clinics and outreach dental missions.

An increasing portion of the population cannot afford the cost of traditional dentures due to the costs. The average fees of a full set of upper and lower dentures in the U.S. is $3,400.3

**Indications for the Larell One Step Denture: Private Practice**

The indications for the Larell denture are similar to traditional dentures. They are used for the fully edentulous patients (Fig. 2), single upper or lower dentures and for immediate placement dentures following extractions. The use in implant retained dentures is increasing rapidly (Figs. 3 & 4). The doctor now has the opportunity to fabricate a complete set of dentures, place immediate load implants and have the entire implant retained dentures completed in a single office visit, usually less than two hours. It is profitable for the dentist, affordable for the patient and is a real practice builder. The Larell denture can also be used for an all-on-four dental implant fixed provisional appliance (Fig. 5), saving both time and money in the process.

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**Fig. 2: Final dentures in place**
**Fig. 3: Upper implant retained denture, attachments in place**
**Fig. 4: Upper implant retained denture in mouth**
**Fig. 5: Provisional for all-on-four dental implant reconstruction**

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Indications for the Larell One Step Denture: Philanthropic

Due to lack of affordability and access to care, thousands turn to free dental clinics such as the Mission of Mercy free dental clinics sponsored by state dental associations. Virginia and California are two of many states that hold free dental clinics. In a weekend clinic, thousands of patients will be seen for all types of dental treatment. Complete dentures are very infrequently done due to the multiple steps, and those done over a weekend are delivered months later. But now, being able to create full dentures in a single one-hour visit is a service that can be offered. Instead of leaving as a dental cripple with no teeth, patients are now able to have their dentures on the spot. In a typical weekend clinic, with three to five dentists, a hundred dentures can be fabricated and delivered.

Though there is great need for philanthropic dental work here in the U.S., there is also great need worldwide. Without the resources for dental treatment available here, it is virtually impossible to provide dentures through dental mission work worldwide. Many countries have no dental lab facilities to process dentures and even if they did, the time frame would preclude full dentures. However, the need is still there. Due to its portability, the Larell One Step Denture system is addressing this worldwide need. We have been involved with different groups to be able to provide dentures in Honduras, Nicaragua, Peru and other countries. As long as there is electricity to charge batteries and boil water, the Larell dentures can be made anywhere. The nutrition and health benefits are amazing, not to mention the instant smiles and increase in self esteem.

One-Hour Denture Technique

The one-hour denture technique is predicated on a set of prefabricated thermoplastic denture templates with the teeth in place and finished on the outer surface. To determine the sizes of the denture templates, more than 1,000 consecutive edentulous models were evaluated with predetermined measurements, such as ridge thickness, inter tuberosity distance, etc. The measurements were evaluated through mathematical formulae and categorized into five groups that encompassed all but the extreme outliers of the measured models.

The thermoplastic template can conform to all but the extreme edentulous ridge structures by heating in boiling water for about 40 seconds then becoming malleable and adapting closely to the model (for immediate dentures the impression and model are done following the extractions). The efficiency of the process is due to the fact that the template comprises the custom tray, wax rims and wax try-in. There is room for movement of the teeth, segments of teeth, flanges, palate and mylohyoid extensions within the templates due to their thermoplastic ability. Because there is no memory, the templates can be reheated many times to
achieve the proper fit on the model. If extreme movement is needed the template can be notched and expanded or contracted as needed. This is all completed on a quick-set stone model taken at the time of the visit (Fig. 6).

The upper denture is done first, with the template being tried in the mouth and positioned properly with an occlusal plane plate (OPP). The OPP is used to determine the ala-tragal line and the Frankfort horizontal plane (Fig. 7). The anterior posterior position (lip support) and the tooth show are determined visually. There is no better method to determine lip support and tooth show than directly in the mouth. The flanges are then trimmed (Fig. 8) to allow approximately 2-3mm of space between the flange and the height of the vestibular fold and 1-2mm of space (Fig. 9) between the template and the model to allow sufficient room for the reline material (Fig. 10). The ability to easily modify the template before reline is a key factor in the denture’s success.

Once the template has been prepared with the flanges adjusted and the template adapted to the ridge, it is ready for an in-the-mouth functional reline. The recommended reline material is Flexacryl (Lang Dental Manufacturing Co., Wheeling, Illinois).

Many reline materials have been tested and the working qualities—mixability, low porosity, low exothermic reaction and cost effectiveness of the Flexacryl—make it the material of choice (Fig. 11). Though most dentures will utilize the Flexacryl hard reline material, Flexacryl soft reline can also be used. This is indicated where there is an undercut present or additional areas of retention for a resorbed ridge are desired, such as the mylohyoid ridges in the mandible.

The hard-reline and soft-reline material can be used in the same denture if necessary to give a combination of retention and comfort. If desired, stops composed of the reline material can be placed in the anterior and bilateral posterior areas of the template. This will allow exact placement of the template at the predetermined position during the reline process. The template is removed from the mouth when the reline material hardens. Should the dentist desire a darker gingival color for darker-skinned patients, tinting can be added to the monomer of the reline material to obtain the desired color (Fig. 12).

The final finish and polish is accomplished at a later step in the standard fashion. For the upper denture, a post dam is placed after the initial reline and painted in with the reline material. The lower denture is then relined in a similar fashion. It is tried in the mouth to be certain the occlusal tables are aligned and the flanges are in good position. The teeth can be moved and the flanges can be adjusted to allow for a proper fit. When the lower template with reline material is placed into the mouth, the patient slowly closes. The teeth

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line up with the upper template and the ridge closes into the template. Vertical dimension is checked at this time to ensure proper freeway space (1-2mm closure past the previously marked distance). After rough trimming both dentures are replaced into the mouth. Pressure-indicating paste is used to check for any high spots on the mucosal surface, done a minimum of three times (Fig. 13), and articulating paper is used to fine tune the occlusion. The dentures are then finished and polished in the standard fashion with pumice and high-polish material (Figs. 2, 14 & 15).

Discussion

The advantage of dentures that can be fabricated in one hour is there is no waiting or lab time necessary before extracting the teeth and placing the denture. This is significant for immediate dentures. Contrary to conventional technique, the impression for the denture is taken after the teeth have been removed and the alveoplasty performed. This is a real benefit as the denture is fit to the exact post-extraction position, not an approximation of what the ridge will look like after surgery. With an exact fit, the denture will be more comfortable, have a very accurate fit, and likely cause less post-placement bone resorption due to its increased stability. They are very useful for spare or emergency dentures and can be used for interim surgical obturators for cancer surgery patients. Future uses will include intermediate dentures for children with ectodermal dysplasia who are missing some or all of their teeth. A one-hour technique will eliminate much chairtime as the children grow, outgrowing their dentures like they outgrow their shoes.

Though not meant to replace traditional dentures as a patient service, current economic conditions are making it more difficult for many to afford and have access to complete dentures. Dental practices are not growing, and dental incomes are flat. An alternative technique for complete denture fabrication is demonstrated in this article. It meets the needs of the dentist, increasing the patient base and increasing the profit margin, and meets the needs of the patient, who can now have full dentures that are affordable and convenient. It addresses the needs of the uninsured and economically challenged patients as well as those with difficulty accessing denture care.

The significant factors for success in dentures are fit, form and function. Achieving these factors meets the standard of care for denture treatment. A denture must have the best retention and support possible based on the patient’s mouth condition. It must have the appropriate appearance with regard to lip support, tooth show, occlusal planes and natural look of the teeth. It must also function well for the patient to allow for proper mastication and digestion. These are all achieved in a properly constructed denture. The Larell One Step Denture follows the scientific principles of denture fabrication, meets the standard of care, and is accepted by the patient, the dentist and the profession.

A comparison of a series of conventional dentures to a similar series of Larell dentures demonstrated an overall satisfaction rate of the conventional dentures of 76.7 percent. The overall satisfaction in the Larell series was 83.6 percent with a 98.4 percent satisfaction of appearance and 80.3 percent able to chew comfortably.6

The technique achieves the necessary factors for denture success. Tooth position over the ridge, proper posterior extension of the occlusal table, natural-appearing lip support and tooth show, and the ability to retain the denture’s stability in function are classic prosthodontic principles7-15 that are present in the Larell denture. Additional factors are built in to assure the most retentive lower denture possible, such as concavities
in the posterior lingual flanges to allow space for the tongue to prevent unseating the denture through tongue movement.

In difficult economic times it is imperative that the dental profession develop methods to treat patients in a cost-effective expeditious manner. This technique is one such offering. It is not meant to completely replace conventional dentures but is an effective treatment alternative that addresses many current needs. With a complete time frame for fabrication of one hour and no laboratory time or expense, the patient is able to have dentures almost immediately. This is significant when dentures are lost or broken and time is a factor. A less expensive method for complete dentures also allows the patient to possibly allocate more funds to implants, thus making the dentures even more stable and functional. The technique is intuitive and easy to learn. A basic knowledge of occlusion and oral anatomy is the basis for the Larell and any other denture. As stated previously, patient satisfaction meets or exceeds the satisfaction levels of conventional dentures, whether new or replacement.

Difficult economic times and dentist’s lack of busyness mandate efficient cost-effective treatment options to be developed in all areas of dentistry, including dentures. Complete edentulism continues to represent a tremendous global health care burden, and will for the foreseeable future. The unique system focuses on the issue of complete dentures in both private practice and in philanthropic use for the ongoing domestic and global denture needs.

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