Researchers at the Oregon Health & Science University School of Dentistry (www.ohsu.edu/sod) have found the majority of patients with self-ligating orthodontic brackets retain fewer bacteria in plaque than patients with elastomeric orthodontic brackets.

The OHSU team also found that a biochemical technique measuring adenosine triphosphate (ATP) driven bioluminescence could be a useful chairside tool in the rapid quantification of oral bacteria and in the assessment of oral hygiene during orthodontic treatment.

The findings are published in the April 2009 issue of the American Journal of Orthodontics and Dentofacial Orthopedics, one of the leading peer-reviewed orthodontia journals.

Acid-producing bacteria that surround orthodontic appliances are a common orthodontic problem. Such bacteria can lead to tooth enamel breakdown and potential discoloration of the tooth surface, and these esthetic changes can persist for many years after orthodontic treatment.

While the newer bonded brackets have many advantages over the old metal bands that were fitted around each tooth, they do impede good oral hygiene, resulting in plaque accumulation and increased tooth enamel breakdown.

Although several studies have investigated the effects of fixed orthodontic appliances on bacterial flora, few studies have compared the effects of bracket architecture — specifically the archwire ligature method — or have evaluated the accumulation of bacteria that occurs with the bonding of fixed appliances.

The OHSU study also was different from other studies in that it was a randomized clinical study, comparing the numbers of oral bacteria in plaque surrounding two distinct orthodontic appliances — self-ligating versus elastomeric ligating, a split-mouth design.

The OHSU study examined 14 patients ages 11 to 17 — each patient containing both self-ligating and elastomeric orthodontic brackets on opposing sides of the mouth — at both one week and five weeks after bonding. The numbers of oral bacteria in plaque surrounding the brackets were evaluated at both appointments, in addition to a pre-bonding appointment, using both conventional plating techniques enumerating bacterial colony number and the ATP-driven bioluminescence technique.

More bacteria, including oral streptococci, were retained at tooth surfaces in plaque in patients with elastomeric orthodontic brackets at both the one- and five-week post-bonding appointments, and bacterial levels were particularly high at the one-week visit. Higher ATP-driven bioluminescence levels also were observed in plaque surrounding the elastomeric orthodontic appliances.

“We were surprised that the manner of ligation promoted differences in the levels of plaque bacteria surrounding the bonded tooth surfaces,” noted Curt Machida, PhD, OHSU professor of integrative biosciences and principal investigator, whose lab was host for the study. “Our results suggest that the use of the self-ligating appliances promote reduced retention of plaque bacteria on tooth surfaces surrounding the appliances.”

A recent study in the journal Anesthesia Progress presents a new technique for treating dislocation of the TMJ (temporomandibular joint) using a deep temporal nerve block.

Traditional treatment has been limited to the application of force, where the jaw is forced back and down into the joint, and in severe cases, general anesthesia alone or combined with surgery is required.

For the new treatment, lidocaine and epinephrine are combined and administered to the deep temporal nerve, which reduces both the sensation of pain and muscle spasms.