

MANAGEMENT & MARKETING

This column is compiled by JCO Contributing Editor Robert S. Haeger, DDS, MS. Every few months, Dr. Haeger presents a successful approach or strategy for a particular aspect of practice management. Your suggestions for future topics or authors are welcome.

In 2005, I started measuring numerous variables on every finished patient, including months in treatment, active visits, emergencies, loose brackets, rebonds, missed appointments, molar classification, extractions, expanders, missing teeth, impacted teeth, type of brackets, and bonding methods. One of my goals was to document the clinical impact of self-ligating brackets and indirect bonding in an effort to improve my orthodontic treatment.

This article will take you through seven years of data analysis, the clinical changes that were made, and subsequent evaluations of bonding methods and self-ligating brackets. RSH

Analyzing Clinical Metrics of Indirect Bonding and Self-Ligating Brackets

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To understand how to finish patients faster and improve the quality of orthodontic treatment

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in my office, I began collecting numerous data points on all debonded patients. Important trends in three variables—number of missed appointments, number of loose brackets, and number of bracket repositionings—were analyzed by Dr. Roger Colberg in a previous Management & Marketing column.¹ That article showed that every missed appointment added an average 1.31 months and .38 visits to treatment; every loose bracket added .79 months and .56 visits, and every repositioning added 1.02 months and .70 visits. The average patient had one missed appointment, one loose bracket, and four rebondings, resulting in an average treatment time of 20.06 months (as opposed to 13.86 months with none of these variables present).

The logical conclusion was to target bracket repositioning, since that had the greatest impact on treatment time. I decided to focus on improving bracket placement through indirect bonding and then to try self-ligating brackets, which purportedly require less wire bending to minimize friction in sliding mechanics.

Assessment of Direct and Indirect Bonding

In 2005, I started experimenting with indirect bonding. There was a learning curve, but I was determined to reduce treatment times. It took several years to collect enough data for legitimate observations. The direct-bonding sample used for this article consisted of all patients who were started between 2004 and 2006 with direct bonding only. Beginning in 2007, I used direct bonding only for patients who had numerous crowns or short teeth. Since I had shifted almost exclusively to indirect bonding by the end of 2006, the indirect-bonding sample comprised starts from 2005

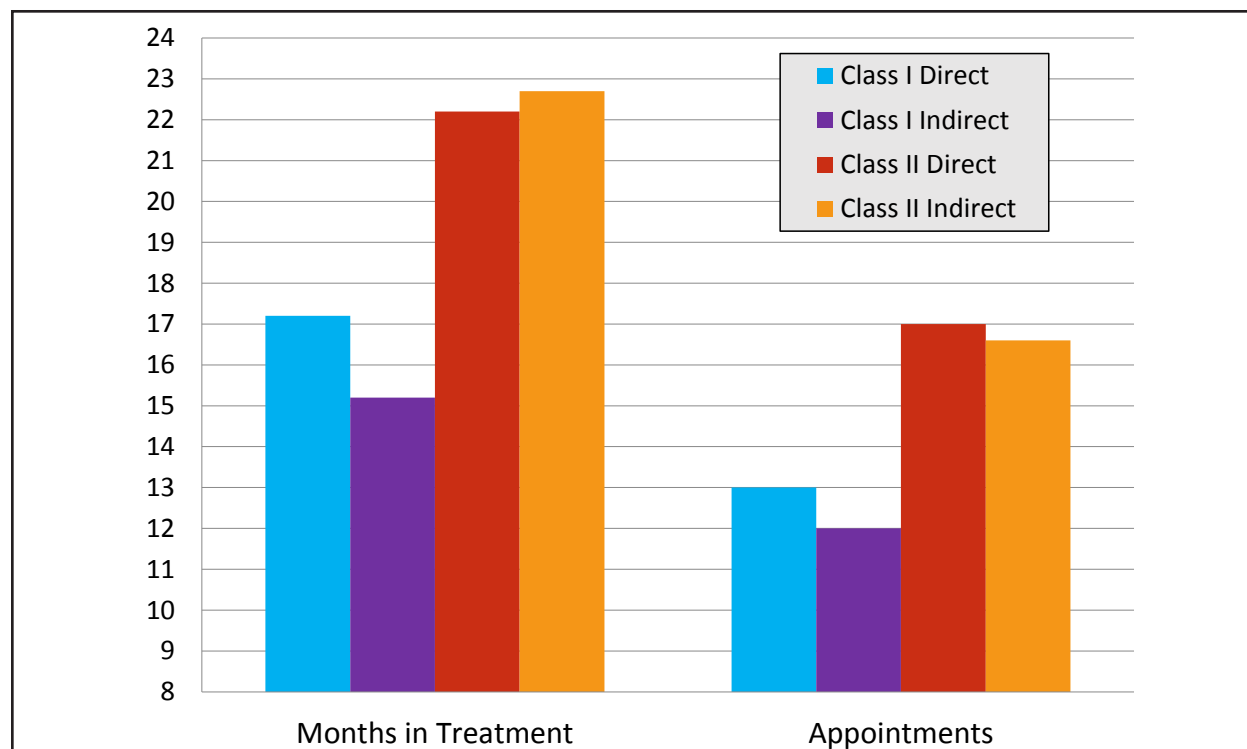


Fig. 1 Mean months in treatment and number of appointments by bonding method for Class I and Class II child nonextraction patients.

through 2010, excluding 2008 (when all patients were started with self-ligating brackets). The last of these treatments were finished in 2013.

By including every patient bonded within a set time period, I avoided some selection bias. If I had examined only the first 30 or so finished cases, I might have evaluated only the fastest treatments without being able to assess the full impact of the clinical appliances.

Though it would have been interesting to study all types of malocclusions and treatment mechanics, there were only two groups that provided enough treated patients for valid analysis: Class I and Class II child patients treated without extractions. All Class I patients shared the following characteristics:

- Full nonextraction treatment
- No impactions or missing teeth
- Treatment with conventional twin brackets
- Age 18 years or younger at the start of treatment

The same parameters applied to the Class II group, except that palatal expanders were used as needed in these patients.

The indirect-bonded Class I child patients required two months' less treatment time and one less appointment compared to the direct-bonded patients (Fig. 1, Table 1). There were no significant differences between the indirect- and direct-bonded Class II patients.

Assessment of Conventional vs. Self-Ligation

I did not wait to complete my analysis of indirect bonding before testing self-ligating brackets in my practice. In 2008, I designed a trial of indirect-bonded self-ligating brackets on the next 300 full case starts, alternating between Smart-Clip* and In-Ovation** brackets. I decided on 150 starts for each bracket model to make sure I was

TABLE 1
MEAN TREATMENT DURATIONS BY BONDING METHOD

	No. Patients	Months in Treatment	No. Appointments
<i>Class I Child Patients</i>			
Direct bonding	161	17.2	13.0
Indirect bonding	225	15.2	12.0
<i>Class II Child Patients</i>			
Direct bonding	127	22.2	17.0
Indirect bonding	66	22.7	16.6

at least somewhat proficient with the appliance and had a large enough sample for analysis. Because I was not able to achieve an exact alternation of bracket types (though I got quite close), I ended up including more than 150 SmartClip cases. The last of the self-ligating-bracket patients were finished around the end of 2010. The sample for twin brackets was the same as in the bonding study described above (all 2005-2007, 2009, and 2010 starts with indirect bonding).

Again, all types of malocclusions were treated, but only one group provided enough similar cases: Class I child patients. Parameters for inclusion were:

- Full Class I treatment
- No extractions
- No impactions or missing teeth
- Age 18 years or younger at the start of treatment

There was no difference in average treatment time or number of appointments among the standard twin, SmartClip, and In-Ovation brackets (Fig. 2, Table 2).

Discussion

Indirect bonding was critical in reducing treatment times for Class I malocclusions in my practice. Bracket repositionings in children declined from an average 2.8 to 1.6 per patient, while rebondings in adults were reduced from 1.7 to 1.2. The impact of proper bracket placement may have

lessened in Class II cases because of the repositionings that were needed during anteroposterior corrections. Despite trying several different tray preparations, I have still seen more loose brackets with indirect than with direct bonding. I will continue to make changes in technique until this issue is resolved, and I would then expect treatment times and numbers of appointments to decline even further.

Truenorth figures show that solo practitioners without associates who used indirect bonding reported 56.8% higher annual profits, 40.1% higher collections, 23.7% higher starts, and 5.6% lower overhead than those who used direct bonding. Because the sample size was small—19 direct-bonding and nine indirect-bonding practices—the profitability advantage of indirect bonding will need much more intensive exploration.

The decision on self-ligating brackets comes down to clinical relevance and doctor preference. I personally didn't like my finished results in terms of anterior root torque, nor did I appreciate the difficulty of managing final rotation control of the lower incisors. I agree that wire insertion and removal is three minutes faster with self-ligating brackets, but I found no practical effect in my office, since I could not schedule patients with 17-minute time slots instead of 20-minute time slots. My own practice data suggest that self-ligating brackets did not reduce treatment times or office visits compared to twin brackets.

Truenorth solo practitioners without associates who did not use self-ligating brackets were 49% more profitable than those who did. Again,

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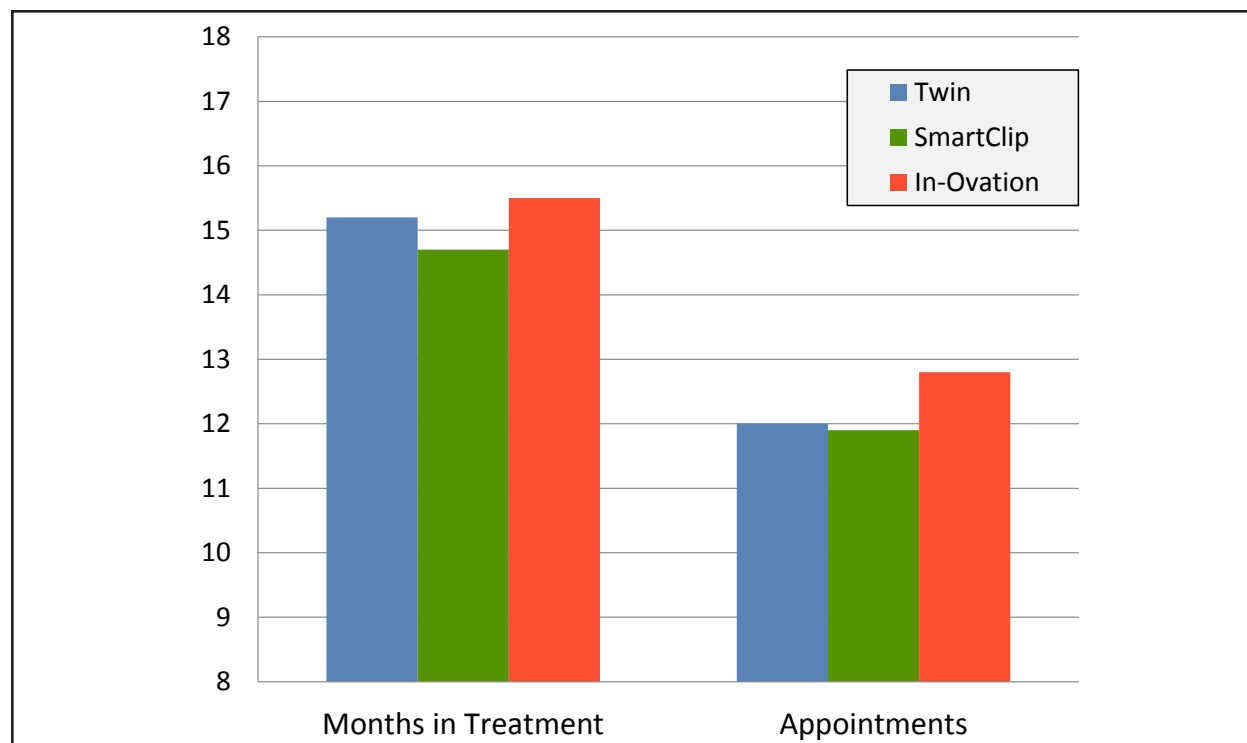


Fig. 2 Mean months in treatment and number of appointments by bracket type for Class I child patients.

TABLE 2
MEAN TREATMENT DURATIONS BY APPLIANCE TYPE

Bracket Type	No. Patients	Months in Treatment	No. Appointments
Standard twin	225	15.2	12.0
SmartClip*	97	14.7	11.9
In-Ovation**	61	15.5	12.8

the sample size was small, with only eight offices using exclusively twin brackets and 20 using self-ligating brackets. An interesting finding: among those 20 practices, the ones with more than 90% of their starts in self-ligating brackets were 20.2% less profitable than the ones with less than 90% of their starts in self-ligating brackets.

Conclusion

Indirect bonding reduced my treatment times by two months and eliminated one office visit for Class I child patients. Self-ligating brackets did not

reduce treatment time or office visits; because I was not able to take advantage of faster wire changes, the appliances added cost without measurable benefits.

REFERENCES

1. Haeger, R.S. and Colberg, R.T.: Effects of missed appointments and bracket failures on treatment efficiency and office productivity, *J. Clin. Orthod.* 41:433-437, 2007.

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