Often the patient’s awareness of their unesthetic smile is built on several factors that they might not fully appreciate at the outset.
Abstract
The rapidly evolving discipline of cosmetic and restorative dentistry constantly creates new challenges. Our traditional approach of planning the final smile design outcome at the consultation stage perhaps should be reviewed, because we need to appreciate that the patient’s perception of their complaint or concern may well change if they align or bleach their teeth first. This article discusses a case where a patient had previously wanted a veneer makeover. As she could see her smile improve with alignment and whitening, her perception and desires changed dramatically.
Introduction

Often the patient’s awareness of their unesthetic smile is built on several factors that they might not fully appreciate at the outset. It is easy to lump color, shape, surface anatomy, and alignment into one problem and assume that there is therefore one solution. Our beliefs about the principles of smile design often short-cut the potential alternatives that are available, because many teachers in cosmetic dentistry have told us that “patients don’t really know what they want”; therefore, follow the guide, get golden proportion correct, get the buccal width out, get the gingival heights symmetrical, get the embrasures progressive, get the line angles correct.

There is nothing wrong with any of these suggestions. All together they produce a beautiful smile, but in the process of deciding to use ceramic veneers to change a smile and achieve all of this rapidly, there is not any option or time for a patient to look at these improvements in stages and see if they meet their expectations.

This has happened many times in the author’s practice. Patients who present wanting a smile makeover due to color, alignment, and tooth shape issues very quickly change their minds about using veneers once their teeth are aligned and whitened. As soon as line angles start to correct and light reflections balance out and become more symmetrical, it becomes very apparent that the incisal outline becomes the main visual focus.

After alignment, this could not be simpler, as it can be done with virtually no preparation or local anesthesia required. If the teeth have been whitened, it is easier to match the shade, too, with simple composite bonding.

Case Study

Chief Complaint and Findings

The patient presented with what she described as a “crooked smile” (Fig 1). She had been to another dentist, who had offered an 8-to-10-veneer smile makeover, so she already understood some of the aims of smile design. That treatment plan had involved placing veneers and some crown lengthening to reduce the gummy smile.

However, after studying her teeth it was clear that there might be some potential to pre-align first. Her upper laterals were mesially rotated by about 30 degrees and the upper left lateral was palatally positioned and in cross bite (Fig 2).

Trauma to her upper central tooth four years earlier, caused by a sports injury, had never been corrected; the patient had simply gotten used to hiding her smile. Upon seeing the occlusal view (Fig 3), the patient became aware...
exactly how much aggressive tooth preparation would be required to place veneers, especially on the laterals.

She understood that she should have her teeth aligned first, before deciding on the next step in design. All options were considered, but because the patient wanted speed and the ability to whiten simultaneously, an Inman Aligner (Inman Orthodontic; Coral Springs, FL) was used.

**Alternatives**

This patient was very eager for a removable solution. If she had accepted fixed brackets, a short-term orthodontic tray system could have been used; however, simultaneous bleaching is not as simple.

Other removable systems such as Invisalign (Align Technology; Santa Clara, CA) or ClearCorrect (Houston, TX) can also be used to move teeth but they are very different in terms of force delivery, wear time, and length of treatment. In this case, the shorter treatment time and fewer hours of daily wear were factors in the patient’s decision making.

**Treatment**

Space calculations were made using a digital space calculator. This uses Hancher’s technique to calculate the

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**Figure 3:** Pre-treatment occlusal view.

**Figure 4:** Trace for arch evaluation. The red line denotes the available space; the green lines show the mesio-distal widths of the teeth being moved, and the total sum equals the required space.

**The amount of crowding equals the available space subtracted from the required space.**
difference between available space and required space\(^1\) (12.2 mm of crowding was present (Fig 4). Hancher showed how the ideal arch form is measured by hanging a jeweler’s chain from the distal of each canine and letting it align with the most ideal arch form after orthodontic correction. This is described as the available space (Fig 3) and is measured by placing the length of chain against a millimeter ruler.\(^1\) The required space is simply the sum of the mesial-distal widths of the teeth being moved and is measured with digital calipers. The amount of crowding equals the available space subtracted from the required space.

An Inman Aligner was used over a period of 11 weeks to de-rotate the laterals and to treat the cross bite (Fig 5). Progressive interproximal reduction (IPR) was used to create space.\(^2\)\(^-\)\(^9\) This meant that no more than 0.13 mm of IPR was performed at each contact at each appointment. Strategic IPR was employed; this means that care is taken in areas where teeth are rotated, because the real contact points are often not actually touching. Instead IPR is performed distally to the incisors, mesially and distally on the canines. The squeeze effect of the Inman Aligner induces a “domino effect,” which can create extra space when needed.
The patient was instructed to wear the Inman Aligner for 18 hours a day.\textsuperscript{10,11} At week 8 of alignment, bleaching was started using hydrogen peroxide gel for 35-45 minutes daily. Simultaneous whitening is a very attractive part of aligner treatment, as, in the author’s experience, it dramatically helps patient motivation. Patients tend to be particularly compliant as they are already used to the routine of aligner wear.

After alignment and whitening and a total of 11 weeks’ treatment (Fig 6), the case was re-examined. The patient could suddenly see that her problem was now more about edge shape.

The edge shape after alignment was actually worse because there had been differential wear as well as trauma. It was now very clear to the patient that only the incisal edges needed building—suddenly, she no longer want veneers. She did not even want the crown-lengthening surgery (Fig 7).

For placement of the incisal edges at week 12, no local anesthesia was administered. No preparation other than slight roughening of the worn incisal edges of the upper left central and lateral incisors. Empress Direct composite (Ivoclar Vivadent; Amherst, NY) was built up freehand on the incisal edge and palatal surface to match the outline of the other central. Dentine and enamel shades of B1 and BL (Empress Direct) were used. The composite was polished vertically using rubber polishing points to try to blend in surface anatomy to mask the join. The process was repeated on the lateral (Figs 8 & 9).

The patient continued to wear the aligner as a retainer and an impression was taken for a wire retainer to be fitted two weeks later.\textsuperscript{12-15}

Discussion
It was especially nice to retain the natural esthetic characterization of this patient. Ceramic work, as beautiful as it can be, would certainly have changed her appearance more. Some may say for the better, but that was not what the patient wanted.

The patient told us that what we had produced with her own teeth, and some minimal composite, was more than she had hoped for. Figures 10-14 show the stages of alignment, combined bleaching, and then bonding.

There are natural imperfections but the route to this result was arguably far more patient-centric and in line with responsible ethics than a result that might have used multiple ceramic veneers. It is an interesting case in that it poses the question: What is preferable—esthetic perfection at the cost of heavy tooth preparation, or minor esthetic imperfection with patient consent and no invasive treatment whatsoever (Figs 15-19).
Figure 10: Right side smile.

Figure 11: Post-treatment, right side smile.

Figure 12: Pre-treatment, left side.

Figure 13: Left side after aligner and bleaching.

Figure 14: After bonding.

Figure 15: Pre-treatment, close-up left side

Figure 16: Post-treatment, close-up left side.

Figure 17: Pre-treatment, right side retracted view.
Conclusion

It might seem controversial to challenge the ideals of smile design, but this change in the diagnostic order of priorities is vital if we wish to give our patients what they actually want. Pre-whitening was a way of giving our patients an alternative view and perception of their teeth. Now, and far more significantly, with alignment techniques patients can see their teeth change and improve far more dramatically. This means they can make their own decisions and dentists can drastically reduce treatment risks by breaking down the process of a smile makeover into stages and reassessing at each point. Now it is possible to align, whiten, and incisally bond a case in less than 12 weeks (Figs 20 & 21). Previously, a case like this might have required 8-10 veneers, cost four times as much, and necessitated significant tooth preparation. A dramatic contrast in pathways has been created.

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References


Dr. Qureshi earned his BDS degree in 1992 from Kings College, London, UK. He is the president elect of the British Academy of Cosmetic Dentistry.

Disclosure: Dr. Qureshi runs hands-on courses with Dr. James Russell and Dr. Tim Bradstock-Smith and lectures on the Inman Aligner worldwide.

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