Pre-Align then design

By Dr. Tif Qureshi

If the nineties were the decade of the Ultra White Hollywood Smile the noughties seem to have ushered in an era of more refined tastes in smile design. While there is still demand for whiter teeth many patients are now asking for a more natural look rather than the over-bright identikit smile designs of the last decade.

In keeping with this more conservative mood patients are also becoming more aware of the good sense of preserving as much of their own tooth structure as possible and are questioning how their restorations will affect the health of their teeth. Can combination therapy with orthodontics and minimal thickness veneers satisfy patients demands for minimum intervention, natural aesthetics and a rapid result?

Smile makeovers with ceramic veneers can certainly achieve patients desire for an instant cosmetic result, for patients with mild misalignment good aesthetic outcomes can be achieved with minimal enamel loss. However for patients with moderate to severe misalignment deep preparation into dentine and possible devitalisation may be the result of trying to align by tooth preparation alone.

Frequently adult misaligned patients have explored and rejected orthodontic options as too slow a route to their aesthetic goal and are willing to risk their pulp to have the perfect smile for their wedding, holiday or new partner. Many of these patients can now be offered a safer way to the ideal smile. The risk of re-storing these patients has been reduced by two recent developments, rapid adult orthodontics and emax high strength pressed ceramics. Appliances such as the Inman Aligner have speeded up the alignment process to as little as four weeks for moderate misalignment in eight weeks for severely misaligned cases. While emax has enabled thinner, stronger veneers to be produced with a natural appearance.

For older patients misalignment is often associated with occlusal abnormalities and enamel wear which paradoxically may become more visible after aligning.

Figure 1. Lateral view

Misaligned anterior teeth often show irregular incisal edge wear which after aligning becomes more apparent due to the differing lengths of the teeth. While the arch alignment may have been perfected the crossed incisal line now becomes more apparent. Starkly outlined against the darkness of the oral cavity the differing incisal outlines of the incisors require further treatment before the ideal smile can be achieved.

Figure 2. Spacowitz capture showing 3.5mm crowding

Lengthening the incisal edges with composite tips may provide a medium term solution particularly on the lower ante- riors where the occlusal lines now become more apparent due to the differing incisal outlines of the incisors.

Figure 3. Occlusal pre op

The Inman Aligner

This patient presented complaining that he hated his smile. He felt they were dark, short and crooked.

On examination several key problems existed. Firstly his anterior teeth were badly mis-aligned. They were also dark having had years of staining and wear had been compounded by occlusal trauma that had worn the edges of his teeth badly allowing of absorption of stain through the tips. The misalignment and occlusal wear also meant that his teeth were actually quite different lengths.

He wanted a great smile and he wanted it quickly.

Several options were available and outlined:

1) Fixed orthodontics - the patient did not want fixed brackets placed in his mouth even with short term ortho being presented as a compromised alternative to a referral for ideal specialist orthodontics.

2) Invisible clear aligner braces - the patient refused this because of the time quoted for treatment, but was keen on the removable nature of the appliance. The cost was also an issue because the patient would still need further treatment afterwards.

3) Veneers

Veneers placed instantly were requested by the patient, but due to the massively destructive preparations, were discouraged immediately. An occlusal view showing the amount of tooth destruction needed was enough to convince the patient that it was a poor choice.

4) Inman Aligner - the patient accepted this because of the short expected treatment time and because he wanted removability.

Our plan was then to perform anterior alignment of the teeth with simultaneous whitening and then to re-assess the smile design and occlusal function afterwards to realign, then design.

Treatment

A full examination with x-rays and occlusal analysis was carried out. Full BACD style photos were taken. Analysis of the occlusal photo showed that there was 3.5mm crowding. We chose to use an Inman Aligner with combined expander.

The Aligner was used over 12 weeks by the patient and only worn 16-18 hours a day.

The patient turned the midline expander once a week and some
progressive, anatomically re-
spectful FPR was carried out.

At week 9 of alignment, bleach-
ing trays were constructed and
shades were taken. A white whiten-
gel was used to whiten over the
same period. Because the Lithium
Dielectric Emax can be removed
and because it only needs to be
worn a maximum of 20 hours a day,
it is very easy for the patient
to whiten at the same time. This
is excellent for motivation.

By week 12 the patient's teeth
were whiter and straighter. The
patient was then held in retention
on a temporary esthetic retainer.

However at this point we needed
to reassess including the patient’s
perception of the aesthetics.

The patient's posterior occlusion
was balanced but he had no ante-
crior or canine guidance.

After alignment we offered the
patient the option to simply use
edge bonding on the upper teeth
as we commonly do but he ex-
pressed a wish to still have ve-
neers to give a fuller look. Upper
dental bonding was simulated by
adding in composite in a mock up
fashion. He viewed the result but
still felt his teeth looked flat and
wished for more thickness.

So at this point a purely additive
wax-up was made and a direct
preview was placed in the mouth

Figure 10. Close view before
Figure 11. Close view after align-
ment
Figure 12. Close view after ve-
neers
Figure 13. Fine anatomy covered
with fine FG diamonds
Figure 14. Enhancing colour
with surface shades
Figure 15. Natural surface mor-
phology and subtle colouring be-
fore glazing and polishing
Figure 16. Final IPS Emax veneers

systemic effect.

layer and fired after each colour
application. The colour must be applied layer on
layer to achieve the texture and feel of
teeth polished for years by the
laboratory. The surface texture in such a delicate
art is created by using an ultrathin veneer. The
method consists of a natural surface texture on
the porcelain that is created by the skilled
ceramist using the Dahl principle. This prin-
ciple is used to create the micro fine
abrasion and diamond polish. This is done

immediate temporary retainer. Of
course once the 6 temps are
removed the teeth will still need
retaining so this could be used
before a fixed retainer was fitted
later. On the fitting appointment,
the temporary veneers were re-
moved and the finals tried in. The
patient was happy and the veneers
were then bonded.

A new impression was taken
to make a wire retainer. In the
meantime the patient wore the
temporary esthetic made on the
veneer cast.

One week later a wire retainer
was given to the technician and he
installed.

The patient was happy with the
new tooth length and dimen-
sions.

At the next appointment, Edge
bonding was placed from the lower
premolar to premolar to open
the bite and enhance guidance.

At this point no retainer was
made by the orthodontic lab was
bonded to the back of the upper
6 front teeth. Because the preps
were minimal the veneers were
going on to the back of the teeth
was easy.

The patient was thrilled with
his result not only because he
achieved a natural more attrac-
tive smile, but also he did it with
the minimal amount of invasion
needed.

Emax veneers

Due to its high strength of 400-
500mpa (compared to feldspatic
teramic 100mpa) Emax ceramic
veneers may be fabricated as thin
as 0.2mm. The high strength
and resistance to chipping when
glazing has little space to create his mag-
ificent smile and make the results more predict-
able and importantly to involve
the patient along the way with
decision-making.

Conclusion

This multidisciplinary case shows
what is possible when orth-
dodontics, whitening, and ad-
vanced ceramic techniques are
combined and sequenced.

Everything is done to simplify
the treatment and lower risk to
make the results more predict-
able and importantly to involve
the patient along the way with
decision-making.

The smile design is performed
progressively not instantaneously.
It allows the patient to see the
improvements in their alignment
and whitening before a final de-
cision on ceramics is made. This
is fundamentally different ap-
proach to what has gone before
and thanks to the new techniques
available such as simpler anterior
orthodontics and Emax technol-
yogy it is now making advanced
cosmetic dentistry far simpler
and safer for all.

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