

Why teeth keep breaking?

When people hear “dental crown”, the first word they think of is “expensive”.

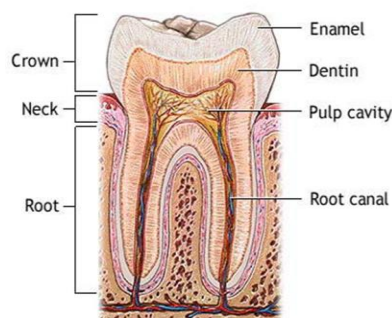
Dental crown treatment might cost more than possible alternatives, but have you ever given some thought to what a dental crown is? What it does? Why teeth sometimes need a dental crown? And whether cheaper options such as replacing a filling or simply getting rid of a decayed back tooth might fix the problem just as well? The list of possible questions goes on.

Here are some answers that may surprise you.

What crowns and arches have in common

Why teeth sometimes need crowning calls for a thorough explanation. In order to do this we have to look at the structure of a tooth and then also into its history, i.e. what happened to it that it requires a crown.

A tooth has a very strong anatomical structure. It consists of a combination of 3D-arches which give the tooth its strength.



Here is a cross section of a tooth.

The enamel covers and protects the tooth. Enamel is the hardest substance in the body. It gives the tooth strength and protects it against acid and bacteria in the mouth.

Think of the enamel on this tooth as an M, or two **arches**. But if you think three-dimensionally, you will realise the shape is actually two **domes**.

Architecturally, arches are some of the strongest structures known to mankind.

Look at these ancient ruins that survived thousands of years.

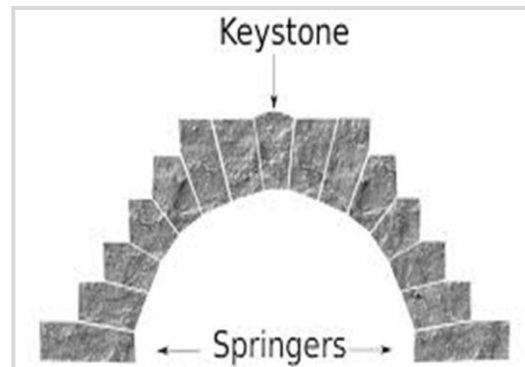
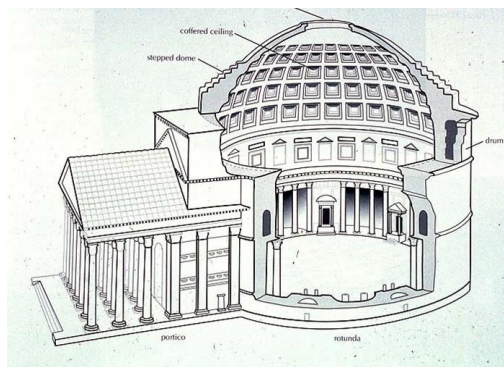


As you see: the only surviving structures are the intact arches.

Let's talk
teeth

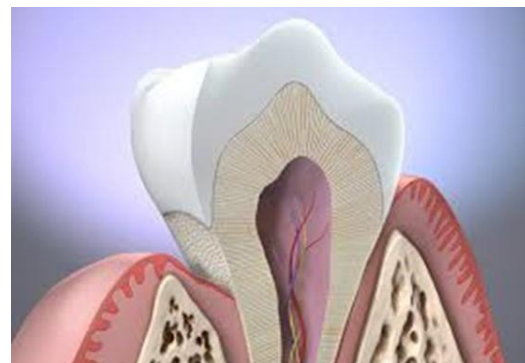
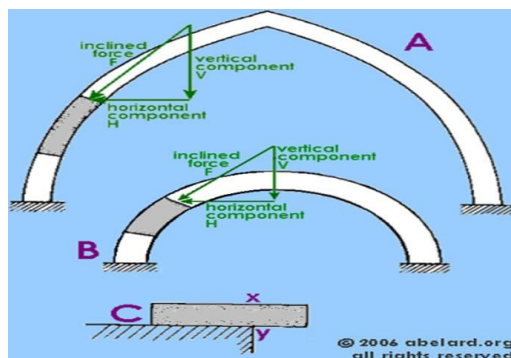
Some of the world's architectural wonders include domes, which are actually a circle of arches.

If we take a closer look at arches, it turns out that they have some very important elements: the **keystone** and the **springers**.



So how does this compare to a tooth?

Notice the white part (enamel) of the tooth on the right. And then let's look at domes and how forces apply to them.



The dome shape is one of the strongest engineering structures.

Too abstract?

Then let's look at some commonly used items: tea cups. Tea cups are porcelain domes and when intact, they are actually very, very strong.

You will be surprised how strong they actually are.



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Hint: look under the tyres. If any of those cups had a material weakness or a crack, this experiment wouldn't work.

Now imagine how wonderful our teeth are with their incredible, natural strength.

How fillings work

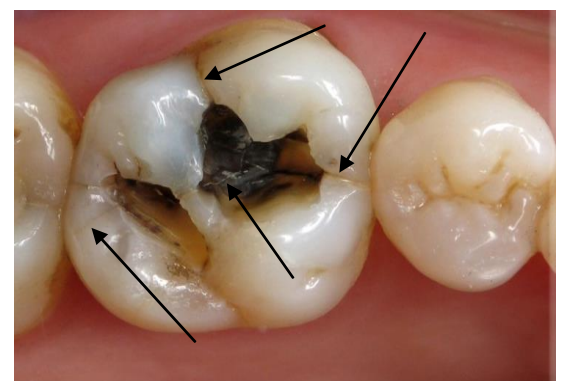
However, there is a common problem with teeth: decay can destroy their structure and eat through the enamel. Once this happens the tooth needs a filling.

A filling is a good option to fill a gap where decay has been removed, but it weakens the dome or arch structure of a tooth and therefore significantly weakens the tooth as a whole.



This is because, mostly, when fillings are placed the “keystone” or “springers” are destroyed or disturbed.

Usually, what happens next is that the tooth around the filling starts to break or fracture. We see this every day (and we can show it to our patients using our intra-oral camera), so we have to think carefully how to “fix” this problem.



Placing a larger filling is one option, but it means the remainder of the tooth will be left even weaker than before.

Look at the same tooth with the filling removed. Notice the cracks in the tooth.

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This is the dilemma we are faced with every day: teeth need fillings to restore decayed substance, but fillings weaken teeth and therefore they will fracture under biting forces at some stage. This increases the risk of tooth loss or root canal treatment.

Risk of fractures spreading into the roots or the nerve of the tooth as pictured above are real, and we often see teeth breaking into the roots.

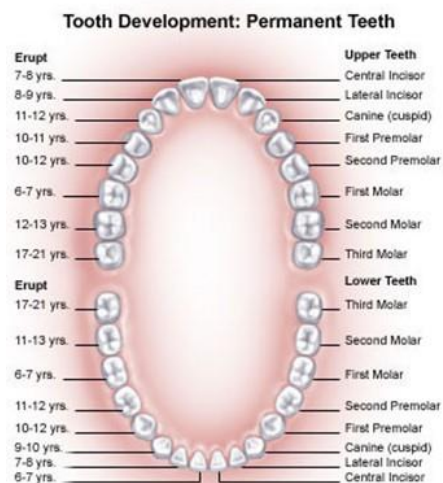
The importance of intact arches

If you look not at the individual tooth but the entire set of teeth, you will notice that the teeth in the upper and lower jaws also form arches. The same rules apply here. A complete arch is strong, but once we start to take teeth out of the arch we weaken the whole system and it starts to break down.

As we expect to live longer with modern medical technology we will need our teeth for much longer too.

The older we get, the more we need our teeth for digestion since the rest of the digestive system slows down. If your teeth aren't in good working order when you get older, or if you have dentures, you tend to swallow food in bigger pieces, thus putting more pressure on an already ailing digestive system. This can lead to a whole array of other medical complications.

One such case of ours was a medical doctor. He lost his upper teeth and had to wear a denture. Because he couldn't cope with his denture he decided to have five dental implants with a full permanent bridge to replace the denture. Six months later, at his follow-up appointment, he was not only very happy with his new teeth. He also said that he had come off a lot of his medications and was blown away by the effect his new teeth had on his health.



This coming from a retired medical doctor was a revelation to us. It made us realise once again how important proper chewing is for general health, especially when we need it most as we get older.

So we are left with this problem: decay weakens teeth, and fillings are patches that fill gaps but leave teeth weak or make them even weaker.

What now?

The answer is: we need something that mimics nature and creates a new arch.

The solution is something that braces the tooth from outside instead of going into the tooth like a filling.

We also need a material that is very similar to enamel, a glass-like substance. (When we repair teeth with a filling material – either plastic/resin for white fillings or metal/amalgam, we are using a material that is different from enamel and reacts differently under stress, i.e. biting forces.)

Dental crowns mimic nature most closely

The best solution we have is a dental crown. It can be made from metal, porcelain or a combination of both. A crown creates a new dome over the tooth to replace the enamel.



Full-porcelain crowns are made from a glass-like substance that covers the whole tooth and restores it to its maximum strength.

Imagine you take a tooth like the one in the initial cross section and remove everything except the enamel. What you are left with would be a glass-like substance that looks very similar to a dental crown.

The above picture is of a full-porcelain dental crown.

Full-porcelain dental crowns let light shine through and look very natural when in the mouth.

Crowning a tooth drastically reduces any chance of damage to the tooth.

If crowns are placed soon enough, i.e. before any fractures reach the nerve of the tooth, it can be done without removing the nerve of the tooth.



How are dental crowns made?

Traditionally, the procedure starts by numbing the tooth. Then the old filling and all the weakened tooth structure are removed. Next a margin is prepared around the tooth; think of it as the springers of the arch. The circumference of the crown will rest on this margin, and all biting forces will be transferred to this area.

Then a rubber impression is taken of the tooth or teeth, and also another impression of the opposing teeth. Finally a so-called bite registration impression is taken of the upper and lower teeth to show how the teeth should meet. After these procedures all the records are sent to a lab where a dental technician makes the crown.

In the meantime a plastic temporary crown is placed with temporary cement to protect the tooth. 10 to 14 days later the crown will be ready and back from the laboratory.

On the next visit the tooth is numbed again, the temporary crown is removed, and the permanent one fitted and tested. If everything fits, the final crown will be cemented in place.

What we do different at ER Dental

At ER Dental we know our patients don't like coming to see us, and we understand this. Also, nobody wants to spend more of their valuable time in a dentist's chair than is absolutely necessary.

We have invested in the latest 3D CAD/CAM technology (Computer Aided Design/Computer Aided Manufacturing), and therefore we can make this process much more efficient for our patients.

We still numb the tooth and prepare it the same way as in the traditional technique, but then instead of rubber impressions, we take a digital 3D scan of your mouth with a small camera.

These data are imported into a special computer, and the dentist designs the crown on the computer with CAD software.

This information is then sent to a 3D milling unit next door. This unit carves (mills) the crown from a solid block of porcelain. Then it goes into a furnace to add some staining and colouring to the crown. Once out of the furnace the crown can be fitted.

All of this happens in one appointment and takes around two hours.

What this means is: we only numb you once, and you don't have to wear a temporary crown for two weeks. The entire procedure is over in only one visit.

If the crown does not fit perfectly when we try it in, we can fix it in the same visit instead of having you wait another two weeks to get it corrected at an external lab.



At ER Dental we LOVE this technology. So do our patients.

We believe we can offer a solution to our patients that will not only strengthen their teeth and have them chewing happily when they are older, but also make their dental experience enjoyable.

We love doing crowns because we know that adding strength to teeth will in most cases preserve the vitality of the tooth. Our aim to save your teeth if possible, for as long as possible.

We also believe in a pro-active approach, i.e. that crowning teeth early enough will prevent major problems in future.

This is why we have so many satisfied patients who appreciate our service.

We would love to build lifelong relationships with our patients, and nothing gives us more joy than to have happy patients with healthy teeth.

We pride ourselves on our service, and the team at ER Dental work very hard to live up to our slogan: "The dentists with a difference".

We only judge ourselves and our service by what our patients say.

Please read the customer reviews for ER Dental on Google reviews or check out the reviews on our Facebook page.

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