

含炭美白牙膏這件事：對於琺瑯質的磨耗以及影響

Charcoal Whitening: Level of Abrasiveness and Effects on Enamel

By Michelle Nguyen, RDH - April 30, 2018



在牙科市場蓬勃發展中，對於改善口腔健康的新發明以及清潔用品正持續地被引入；特別是牙齒美白，更成為了現在大家追求的新趨勢。而現在正流行著使用天然添加物”木炭”達到牙齒美白的效果，在目前市售的商品中也開始看見大量含炭的口腔清潔商品。

含炭美白牙膏是怎麼作用的呢？

多數的牙齒美白的產品，通常透過兩種方式之一達到美白效果：(1)利用化學原理，由牙齒的內部到外部透過化學原理達到美白效果(2)利用物理原理，透過物理作用來去除牙齒表面的污漬。

〔1〕含炭產品則是透過物理原理，去除琺瑯質表面的汙漬，但是在美白的同時，也可能造成琺瑯質的傷害-磨耗。在本文中，將針對含炭商品對於琺瑯質造成的傷害進行相關的實驗研究以及專家文章資料收集以及分析整理結果。

含炭美白牙膏相關研究

一項研究中，透過丙烯酸樹脂比較含炭美白牙膏、一般美白牙膏以及水的磨耗程度。結果發現含炭美白牙膏滌去比一般美白牙膏具有更大的磨耗程度。但此研究並沒有針對含炭美白牙膏對於口腔或是對於身體使用上的安全性進行評估。研究結果並不建議使用含炭美白牙膏，因為炭的顆粒大小，可能會卡在牙齒的窩溝或是填補物與牙齒的縫隙中。〔2〕

一篇刊登在 The Journal of Physics 的研究，比較使用三種不同清潔方法對於牙齒表面粗糙度的影響。研究人員使用被拔除的牙齒，測量每顆牙齒頰側面的粗糙度。使用水、強力配方美白牙膏以及含炭牙膏，透過機器模擬刷牙的時間，1 個月、2 個月以及 3 個月，並測量刷牙後牙齒前後粗糙度的差異。結果發現粒子較大的木炭的確具有較大的磨耗力，導致相較於其他清潔方法，造成牙齒的表面更加粗糙。〔3〕

最新的一篇學術文章，收集所有有關含炭牙膏相關的研究資料，在 118 篇的文章中，發現含炭牙膏對於牙齒的影響，包含 2 篇齲齒漸少，3 篇則是具有負面的影響，包含齲齒增加、琺瑯質的磨耗增加以及其他負面影響，則有 1 篇發現對口腔衛生並沒有特別影響。在網路廣告多標示含炭牙膏具有抗菌、抗病毒，甚至有排毒的效果。在目前的研究中發現其實對於含炭牙膏的影響不一致甚至相互矛盾。目前還沒有明確的證據證實廣告中描述含炭牙膏的使用對於口腔的益處是否為真。〔4〕

含炭美白的磨耗

正如前面提及的 2 篇研究中所提到，炭會導致琺瑯質的表面產生磨耗。基於這 2 篇研究有限的數據，炭對於牙齒長期的問題目前不太清楚，但對於大眾還是有可能會造成的問題，例如琺瑯質喪失或是軟化，導致牙齒變脆弱，並容易發生意外與傷害。〔5〕雖然目前的研究中並沒有明確的結果以及一致的結果，因此在更大的研究或是更明確的結果出來之前，我們必須要謹慎使用。

隨著牙科市場日益增大，我們正在開發許多的產品，而產品的效果可能會有效果，也能沒效。而含炭的產品越來越受歡迎，不過目前尚未有明確的證據可以支持或是否定廣告商所標榜的效益，但是身為專業人士我們必須盡我們所能傳遞更多相關的訊息以及指導大眾，讓他們了解知情，更加了解他們的選擇和購買。

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The dental business is a booming structure that is constantly being introduced to new inventions and dentifrices intended to improve oral health. Whitening has become the new sought after trend that is said to be achieved naturally with the use of the popular additive charcoal. With the added benefit of being “natural,” charcoal whitening has quickly become the item that seems to check all the boxes.

How Charcoal Whitening Toothpaste Works

Most whitening products work by one of two ways; the first is from the inside out by chemical means, and the other uses the physical action of abrasion on the surface of the tooth to remove stains.[1] Charcoal products use the latter action to physically remove stains from the surface of enamel. The question that remains is how abrasive it is to enamel. Experimental studies and peer-reviewed articles focusing on the effects of charcoal on the enamel surface will be summarized and reviewed; this will be done in order to determine if any conclusive evidence that charcoal affects enamel abrasion.

Charcoal Whitening Toothpaste Studies

One study chose to test this question was with the use of an acrylic resin maple to demonstrate how abrasive charcoal is compared to toothpaste and water (control.) According to this study, it was found that charcoal is indeed more abrasive than whitening toothpaste. This test did not prove or disprove the safety of charcoal on the oral cavity, or the effects on the body, should it be consumed. They did advise against the usage of charcoal due to the actual size of the particles that have the potential to become trapped in marginal ridges, fractures, and bordering restorations.[2]

The next study performed by The Journal of Physics looked into the roughness of tooth surfaces with the use of three different methods. Using teeth that were previously extracted, researchers initially measured the buccal surface of each tooth. Then, were brushed by water, a Strong Formula toothpaste and a Charcoal toothpaste. Instead of having participants use each different dentifrice, machines were created that simulated brushing for varying amounts of time that would be the equivalent of 1 month, two months, and three months. Afterward, the initial measurements taken before the brushing simulation were compared to after the simulation. The results found that the larger particle size of charcoal was indeed more abrasive causing the surface to be significantly rougher than the control. [3]

The last scholarly article was a literature review of charcoal dentifrices as a whole. A survey of 118 articles. Among those articles, 2 found a reduction in caries, 3 had negative impacts (increased caries, enamel abrasion, or other negative impacts), and 1 article found no specific effects on oral

hygiene. Internet advertisements claim charcoal toothpaste to be antibacterial, antifungal, antiviral and claim benefits to oral detoxification. These results from the peer-reviewed article demonstrate how some of the claims about the effects of charcoal can be so different and even contradictory. At this time there is no clear evidence that charcoal has any of the beneficial claims that advertisers use to draw in consumers.[4]

Charcoal Whitening Abrasiveness

As the two studies found, charcoal is possibly abrasive on the surface of enamel. The long-term problems are not yet known, but based on the limited data from these two studies, it is plausible that charcoal could lead to problems for patients for such as weakening enamel, which increases the chances that teeth are more fragile and prone to accidents or “physical forces.” [5] While these peerreviewed articles did not draw any conclusive evidence, it did show that experiments and conclusions based on these experiments contradicted one another. Until we have larger studies that can conclusively point us in a concrete direction, at this time we just have to take caution.

With the widening of the dental market every day, we are becoming introduced to many products that may or may not work. With the growing popularity of items containing charcoal and no definite evidence to support or deny claims made by advertisers, we must do what we can to present patients with as much information as we know. As dental professionals, we are likely to be asked questions about these products, and it is up to us to help and guide our patients. It is our responsibility to encourage them to become more informed, and thus more aware of their choices and purchases.

References

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