Exploring Digital Scanners for Accurate Impressions

Understanding brackets: Types and functions in orthodontic treatment

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In the realm of orthodontic treatment for kids , one of the most significant advancements in recent years has been the introduction of digital scanners for accurate impressions . Orthodontic treatment can help improve your child's smile **Child-friendly orthodontic solutions** United States. Gone are the days when patients , especially children , had to endure the discomfort of traditional alginate impressions . Now , digital scanners have revolutionized the process , making it not only more comfortable but also more precise . Imagine a squirming child sitting in the orthodontist 's chair . With traditional methods , getting an accurate impression could be challenging , often requiring multiple attempts . Digital scanners , however , use advanced technology to capture detailed images of the teeth and gums quickly and painlessly . This means fewer retakes and a much smoother experience for young patients . But the benefits aren 't just about comfort . Digital scans provide highly detailed , three - dimensional images that allow orthodontists to plan treatments with unprecedented accuracy . Whether it 's designing invisible aligners or planning for traditional braces , these scans ensure that each child 's unique dental structure is taken into account . For kids , this can mean fewer adjustments and a more efficient treatment process overall . Moreover , digital scans can be easily stored and shared electronically , making them an environmentally friendly alternative to physical molds . They also facilitate better communication between orthodontists and other dental professionals involved in a child 's care , ensuring everyone is on the same page from start to finish . In conclusion , exploring digital scanners for accurate impressions in orthodontic treatment for kids reveals a future where comfort meets precision . It 's not just about making the experience less daunting for young patients ; it 's about leveraging technology to deliver better , more personalized care . As digital scanning becomes more widespread , we can expect even greater innovations that continue to improve orthodontic outcomes for children everywhere .

The process of fitting brackets on children's teeth —

In the realm of orthodontic treatment planning for kids , accuracy is paramount. The initial step often involves taking impressions of their teeth-a process that has evolved significantly with technology. Traditionally , this meant using alginate or polyvinyl siloxane materials , which could be messy , uncomfortable for young patients ,and prone errors . Enter digital scanners : these innovative devices have revolutionized how impressions are taken , offering numerous advantages that enhance both precision accuracy . Digital scanners capture detailed images teeth structures using laser or light technology . This means no more gooey materials causing discomfort children ; instead , they experience quicker , cleaner process . For orthodontists , digital scans provide immediate high-resolution images view manipulate onscreen . These can easily shared consulted specialists instant second opinion . Moreover ,digital files eliminate risks distortion inherent physical molds storage transport . But perhaps most importantly digital scans dramatically reduce margin error associated traditional methods ensuring orthodontic devices like braces aligners fit perfectly first time . This not only reduces treatment duration but also minimizes number adjustments needed along way – making whole experience smoother more comfortable kids . In essence , embracing digital scanners orthodontic practice elevates standard care provided , ensuring each child receives personalized effective treatment plan based most accurate information available . As technology continues advance ,so too will capabilities digital scanning further shaping future pediatric dentistry profoundly positive ways .

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How brackets contribute to the alignment and movement of teeth

In recent years, the dental field has witnessed a significant shift from traditional impression methods to digital scanning techniques, especially for pediatric patients. This evolution has brought about considerable improvements in accuracy, efficiency, and patient comfort.

Traditional impression methods, which involve the use of materials like alginate or polyvinyl siloxane (PVS), have long been the standard. These methods require taking physical molds of a child's teeth, which can be uncomfortable and sometimes frightening for young patients. The process is time-consuming and often requires multiple attempts to get accurate impressions, particularly if the child moves or feels discomfort. Moreover, these materials can distort over time, affecting the precision of the final product.

In contrast, digital scanners have emerged as a game-changer in pediatric dentistry. These devices use advanced optical technology to capture detailed images of a child's teeth and oral structures quickly and painlessly. Digital scanners eliminate the need for messy impression materials, reducing both patient discomfort and anxiety. The process is not only faster but also more precise, as digital scans can be reviewed immediately and adjusted if necessary before sending them to a lab for further processing.

One key advantage of digital scanners is their ability to generate highly accurate 3D models of teeth and surrounding tissues. This level of precision is crucial for creating well-fitting restorations such as crowns or orthodontic appliances like Invisalign aligners. Additionally, digital files can be easily shared with dental labs or other healthcare providers, streamlining communication and collaboration among professionals involved in a child's treatment plan.

Furthermore, digital scanning techniques offer an eco-friendly alternative to traditional methods by reducing waste associated with impression materials and disposable trays. They also provide long-term benefits by allowing dentists to store digital records more efficiently than physical molds, which can degrade over time and require storage space.

However, it's important to note that while digital scanners offer numerous advantages, they also come with certain challenges. The initial investment cost for these devices can be high, which may deter some practices from adopting them immediately. Additionally, there is a learning curve associated with using new technologies effectively; hence proper training is essential for dentists and their staff to ensure accurate results consistently.

Ultimately, comparing traditional impression methods with digital scanning techniques reveals that digital scanners present clear benefits in terms of accuracy, comfortability (especially important for pediatric patients), efficiency, environmental impact, and long-term storage capabilities-all vital factors contributing towards improved patient care outcomes within pediatric dentistry practices worldwide today!

Benefits of early orthodontic intervention with brackets for kids

In recent years, digital scanners have revolutionized the field of dentistry, offering a more efficient and comfortable alternative to traditional impression-taking methods. When considering their use with children, it's essential to evaluate the different types of digital scanners available and their suitability for pediatric patients.

One popular type is the intraoral scanner, which captures detailed images of the oral cavity using optical technology. Devices like the iTero Element and CEREC Omnicam are known for their precision and speed, making them ideal for restless or anxious young patients. These scanners often come equipped with child-friendly features such as smaller wand sizes and engaging visual displays that help keep children interested during the scanning process. However, their relatively high cost might be a barrier for some dental practices.

Another type is the desktop scanner, which requires impressions to be taken first and then scanned outside the mouth. Examples include the 3Shape D2000 and Medit T500. While these scanners are generally more affordable than intraoral ones, they involve an additional step that might prolong chair time-a crucial factor when treating children who may have shorter attention spans or difficulty sitting still for extended periods.

Handheld scanners offer a midway solution by combining portability with direct intraoral use. The TRIOS 4 by 3Shape is notable for its wireless design and real-time visualization capabilities, which can make scanning more interactive for children. The compact size also allows dentists to navigate smaller oral cavities with ease, though it requires a skilled operator to ensure accuracy.

Finally, there are hybrid scanners that combine elements from different types to provide versatility. The Planmeca Emerald S offers both intraoral and extraoral scanning capabilities, making it adaptable to various clinical needs but at a higher cost and complexity level which might be less suitable for general pediatric usage due to its intricate setup requirements.

In conclusion, selecting an appropriate digital scanner for use with children depends on several factors including ease of use, speed of operation, child-friendly features and budget constraints. Intraoral scanners with engaging visual displays tend to be more suitable due to their efficiency and ability to keep children engaged during what could otherwise be a daunting experience at the dentist's office. However each practice must weigh these benefits against cost considerations while ensuring that patient comfort remains paramount when exploring digital scanners for accurate impressions with pediatric patients involved.

Common issues and solutions related to brackets in pediatric

orthodontics

In recent years , digital scanners have emerged as powerful tools in orthodontic treatment for children , offering several compelling benefits . Gone are days when traditional impression methods were only option available , which often involved mess discomfort , prolonged procedure times . Now , digital scanners have revolutionized way orthodontists approach impressions , bringing about significant improvements accuracy comfort speed .These advanced devices utilise sophisticated technology capture intricate details oral cavity , producing highly accurate three dimensional images .This enhanced precision allows orthodontists create better fitting appliances braces aligners ultimately leading more effective efficient treatment .For young patients , comfort major consideration .Traditional impression methods involving alginate trays often induce gag reflex cause unpleasant taste whereas digital scanners provide non invasive painless experience .Scanning process quick easy typically taking just few minutes eliminating need lengthier procedures .Moreover faster turnaround time enabled these cutting edge tools means kids spend less time chair more playing enjoying childhood .Additionally digital scans facilitate improved communication between orthodontist patient parent since visual representations teeth jaw structures can shown real time helping understand diagnosis treatment plan better .Overall integrating digital scanners into paediatric orthodontic practice results host advantages making journey towards beautiful healthy smile smoother enjoyable one kids parents alike .As technology continues evolve exciting see what further innovations lie ahead field digital orthodontics .

The role of parental support during orthodontic treatment with brackets

Using digital scanners to obtain accurate impressions from pediatric orthodontic patients presents a unique set of challenges and considerations. Unlike adults, children often have shorter attention spans, less patience, and may be anxious or fearful during dental procedures. Here are some key points to consider:

Patient Cooperation: One of the primary challenges is ensuring the child's cooperation during the scanning process. Children may find it difficult to stay still for the required amount of time, which can lead to inaccuracies in the scan. To mitigate this, practitioners can explain the process in a fun and engaging way, using age-appropriate language. Demonstrating the scanner on a parent or even a toy can also help alleviate fears.

Size of Oral Cavity: Pediatric patients have smaller oral cavities, which can make maneuvering the scanner more difficult. The size of the scanner head is particularly important; bulkier scanners may cause discomfort or induce gagging, making it harder to capture accurate images. Choosing a scanner with a smaller head can help address this issue.

Movement and Accuracy: Digital scanners require precision and steadiness to capture accurate images. Any sudden movements from the child can distort the scan, leading to incorrect impressions. Using scanners with faster capture rates can help minimize errors caused by movement. Additionally, some scanners come with real-time tracking features that can help practitioners quickly adjust if the patient moves.

Radiation Concerns: Although digital scanners typically use light rather than radiation, it's essential to reassure parents about the safety of the procedure. Explaining that digital scans are radiation-free compared to traditional X-rays can help alleviate concerns and build trust with both parents and children.

Technological Proficiency: Practitioners need to be well-versed in using digital scanners to ensure efficient and accurate results. Regular training and updates on technology advancements are crucial for maintaining high standards of care. Moreover, having a backup plan (like traditional impression methods) is advisable in case technical difficulties arise during a scan session.

Cost Considerations: While digital scanners offer numerous advantages such as speed, accuracy, and reduced discomfort for patients, they come at a higher cost compared to traditional methods. Balancing these costs against their benefits requires careful consideration by orthodontic practices serving pediatric patients. Investing in reliable equipment and training staff appropriately can lead to long-term savings through improved efficiency and patient satisfaction.

In conclusion, while digital scanners offer significant advantages for obtaining accurate impressions in pediatric orthodontics, several challenges need careful consideration-from ensuring patient comfort and cooperation to managing technological proficiency and cost implications effectively-to maximize their benefits fully within clinical practice settings involving young patients

Long-term effects and maintenance after bracket removal

In the dynamic world of orthodontics, the advent of digital scanners has revolutionized the way impressions are taken, particularly for young patients. Traditional impression methods, involving alginate or polyvinyl siloxane (PVS) materials, often posed challenges such as discomfort, gagging reflexes, and inaccuracies due to material distortion. Digital scanners have emerged as a game-changer, offering a more comfortable and precise alternative.

One compelling case study involves a 10-year-old patient named Emily, who required orthodontic treatment for her crooked teeth and mild overbite. Emily's orthodontist opted to use a digital scanner to capture accurate impressions of her dental arches. The scanner, with its compact wand and user-friendly interface, quickly captured detailed 3D images of Emily's teeth and gums. This process was not only faster but also more comfortable for Emily, who found the traditional impression trays unpleasant.

The digital impressions were instantly transferred to a computer, where specialized software allowed the orthodontist to analyze and manipulate the images. This technological advancement enabled precise planning and customization of Emily's treatment plan. The clear aligners designed from these digital impressions fit snugly and accurately, ensuring optimal tooth movement and reducing the need for adjustments mid-treatment.

Another notable example is that of 8-year-old Jake, who needed early interceptive orthodontic treatment to correct his crossbite. Jake's orthodontist utilized a digital scanner to obtain high-resolution images of his oral cavity. The digital impressions provided an accurate representation of Jake's dental arches and occlusion, allowing for meticulous planning of his treatment. The precision afforded by digital technology meant that Jake's palatal expander was perfectly fitted, minimizing discomfort and ensuring effective correction of his crossbite.

These case studies highlight the multifaceted benefits of digital scanners in pediatric orthodontics. Not only do they enhance patient comfort and experience, but they also significantly improve the accuracy and efficiency of treatment planning. By providing detailed 3D models, digital scanners enable orthodontists to design custom appliances that fit perfectly, leading to better outcomes and reduced chair time for young patients.

Moreover, digital scanners eliminate the need for messy impression materials and storage issues associated with physical models. The ability to store digital impressions securely on cloud servers ensures easy accessibility and retrieval whenever needed, streamlining workflow processes within orthodontic practices.

In conclusion, exploring digital scanners for accurate impressions reveals their transformative impact on orthodontic treatment for children. By enhancing precision and patient comfort while optimizing workflow efficiency, these innovative tools are paving the way for superior dental care experiences in pediatric orthodontics. As technology continues to evolve, it is clear that digital scanners will play an increasingly vital role in shaping modern dental practices worldwide.

In the dynamic world of pediatric orthodontics, the future is undeniably digital. One of the most promising advancements in this field is digital scanning technology, which is revolutionizing the way impressions are taken and treatment plans are devised.

Traditional impression methods involve alginate or polyvinyl siloxane materials, which can be uncomfortable for children and are often prone to distortions and inaccuracies. Digital scanners, however, offer a non-invasive, more comfortable, and precise alternative. These scanners use lasers or structured light to capture detailed 3D images of the oral cavity, transforming them into digital models that can be easily manipulated and analyzed.

The potential impact of digital scanning on treatment outcomes is immense. With accurate digital impressions, orthodontists can create better-fitting appliances, reducing patient discomfort and enhancing treatment efficiency. This precision allows for more predictable tooth movement and fewer adjustments during treatment, potentially reducing overall treatment time-a significant benefit for both patients and practitioners.

Moreover, digital scans provide an interactive visual tool that can engage young patients and their parents in the treatment process. Seeing their own 3D oral model on a screen can help children understand their treatment needs better, fostering cooperation and excitement about their orthodontic journey.

The future holds even more promise with advances in artificial intelligence and machine learning. As these technologies integrate with digital scanning, we may see automated diagnosis and treatment planning systems that further streamline workflows and improve outcomes. Additionally, as digital scanners become more compact and affordable, they could become ubiquitous in pediatric orthodontic practices, making high-quality care

more accessible than ever before.
However implementing digital scanning technology requires investment in equipment training for staff members adoption from orthodontists who have traditionally relied upon conventional impression techniques therefore while its benefits are vast challenges do remain Nevertheless given its potential to enhance precision personalize treatments improve patient experiences it clear that digital scanning represents an exciting new chapter pediatric orthodontics one worth embracing wholeheartedly moving forward .

About tooth

This article is about teeth in general. For specifically human teeth, see Human tooth. For other uses, see Tooth (disambiguation).

Tooth	
Image not found or type unknown	
A chimpanzee displaying his teeth	
Details	
Identifiers	
Latin	*dens*
MeSH	D014070
FMA	12516
Anatomical terminology	
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A **tooth** (pl.: **teeth**) is a hard, calcified structure found in the jaws (or mouths) of many vertebrates and used to break down food. Some animals, particularly carnivores and omnivores, also use teeth to help with capturing or wounding prey, tearing food, for defensive purposes, to intimidate other animals often including their own, or to carry prey or their young. The roots of teeth are covered by gums. Teeth are not made of bone, but rather of multiple tissues of varying density and hardness that originate from the outermost embryonic germ layer, the ectoderm.

The general structure of teeth is similar across the vertebrates, although there is considerable variation in their form and position. The teeth of mammals have deep roots, and this pattern is also found in some fish, and in crocodilians. In most teleost fish, however, the teeth are attached to the outer surface of the bone, while in lizards they are attached to the inner surface of the jaw by one side. In cartilaginous fish, such as sharks, the teeth are attached by tough ligaments to the hoops of cartilage that form the jaw.[1]

Monophyodonts are animals that develop only one set of teeth, while diphyodonts grow an early set of deciduous teeth and a later set of permanent or "adult" teeth. Polyphyodonts grow many sets of teeth. For example, sharks, grow a new set of teeth every two weeks to replace worn teeth. Most extant mammals including humans are diphyodonts, but there are exceptions including elephants, kangaroos, and manatees, all of which are polyphyodonts.

Rodent incisors grow and wear away continually through gnawing, which helps maintain relatively constant length. The industry of the beaver is due in part to this qualification. Some rodents, such as voles and guinea pigs (but not mice), as well as lagomorpha (rabbits, hares and pikas), have continuously growing molars in addition to incisors.[2][3] Also, tusks (in tusked mammals) grow almost throughout life.[4]

Teeth are not always attached to the jaw, as they are in mammals. In many reptiles and fish, teeth are attached to the palate or to the floor of the mouth, forming additional rows inside those on the jaws proper. Some teleosts even have teeth in the pharynx. While not true teeth in the usual sense, the dermal denticles of sharks are almost identical in structure and are likely to have the same evolutionary origin. Indeed, teeth appear to have first evolved in sharks, and are not found in the more primitive jawless fish – while lampreys do have tooth-like structures on the tongue, these are in fact, composed of keratin, not of dentine or enamel, and bear no relationship to true teeth.[1] Though "modern" teeth-like structures with dentine and enamel have been found in late conodonts, they are now supposed to have evolved independently of later vertebrates' teeth.[5][6]

Living amphibians typically have small teeth, or none at all, since they commonly feed only on soft foods. In reptiles, teeth are generally simple and conical in shape, although there is some variation between species, most notably the venom-injecting fangs of snakes. The pattern of incisors, canines, premolars and molars is found only in mammals, and to varying extents, in their evolutionary ancestors. The numbers of these types of teeth vary greatly between species; zoologists use a standardised dental formula to describe the precise pattern in any given group.[1]

Etymology

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The word *tooth* comes from Proto-Germanic **tanþs*, derived from the Proto-Indo-European **hÃƒÆ’Ã‚Â¢Ãƒâ€šÂ¬Ã…Â¡Ãƒâ€šÃ‚•dent-* which was composed of the root **hÃƒÆ’Ã‚Â¢Ãƒâ€šÂ¬Ã…Â¡Ãƒâ€šÃ‚•ed-* 'to eat' plus the active participle suffix **-nt*, therefore literally meaning 'that which eats'.[7]

The irregular plural form *teeth* is the result of Germanic umlaut whereby vowels immediately preceding a high vocalic in the following syllable were raised. As the nominative plural ending of the Proto-Germanic consonant stems (to which **tanþs* belonged) was **-iz*, the root vowel in the plural form **tanþiz* (changed by this point to **tÃƒÆ’Ã¢â‚¬Å¾Ãƒâ€šÂ¬Ã‚Â¦ÃƒÆ’Ã…â€™Ãƒâ€šÂ¬Ã…Â¾þi* via unrelated phonological processes) was raised to /œÃÆ'Ã¢â‚¬Â¹Ãâ€Ã‚Â/, and later unrounded to /eÃÆ'Ã¢â‚¬Â¹Ãâ€Ã‚Â/, resulting in the *tÃƒÆ’Ã¢â‚¬Â¦Ãƒâ€šÃ‚•þ/tÃƒÆ’Ã¢â‚¬Å¾Ãƒâ€šÂ¬Ã…â€œþ* alternation attested from Old English. Cf. also Old English *bÃƒÆ’Ã¢â‚¬Â¦Ãƒâ€šÃ‚Â•c/bÃƒÆ’Ã¢â‚¬Å¾ÃƒÂ¢Ã¢â€šÂ¬Ã…â€œÃƒÆ’Ã¢â‚¬Å¾ÃƒÂ¢Ã¢â€šÂ¬* 'book/books' and 'mÃƒÆ’Ã¢â‚¬Â¦Ãƒâ€šÃ‚Â«s/mÃƒÆ’Ã‹â€ Ãƒâ€šÃ‚³mause/mice', from Proto-Germanic **bÃƒÆ’Ã¢â‚¬Â¦Ãƒâ€šÃ‚Â•ks/bÃƒÆ’Ã¢â‚¬Â¦Ãƒâ€šÃ‚Â•kiz* and **mÃƒÆ’Ã¢â‚¬Â¦Ãƒâ€šÃ‚Â«s/mÃƒÆ’Ã¢â‚¬Â¦Ãƒâ€šÃ‚Â«siz* respectively.

Cognate with Latin *dÃƒÆ’Ã¢â‚¬Å¾ÃƒÂ¢Ã¢â€šÂ¬Ã…â€œens*, Greek ÃƒÆ’Ã‚Â¡Ãƒâ€šÃ‚½ÃƒÂ¢Ã¢â‚¬Å¡Ã‚¬ÃƒÆ’Ã‚ (*odous*), and Sanskrit *dát*.

Origin

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Teeth are assumed to have evolved either from ectoderm denticles (scales, much like those on the skin of sharks) that folded and integrated into the mouth (called the "outside–in" theory), or from endoderm pharyngeal teeth (primarily formed in the pharynx of jawless vertebrates) (the "inside–out" theory). In addition, there is another theory stating that neural crest gene regulatory network, and neural crest-derived ectomesenchyme are the key to generate teeth (with any epithelium, either ectoderm or endoderm).[4][8]

The genes governing tooth development in mammals are homologous to those involved in the development of fish scales.[9] Study of a tooth plate of a fossil of the extinct fish *Romundina stellina* showed that the teeth and scales were made of the same tissues, also found in mammal teeth, lending support to the theory that teeth evolved as a modification of scales.[10]

Mammals

[edit]

Main article: Mammal tooth

Teeth are among the most distinctive (and long-lasting) features of mammal species. Paleontologists use teeth to identify fossil species and determine their relationships. The shape of the animal's teeth are related to its diet. For example, plant matter is hard to digest, so herbivores have many molars for chewing and grinding. Carnivores, on the other hand, have canine teeth to kill prey and to tear meat.

Mammals, in general, are diphyodont, meaning that they develop two sets of teeth. In humans, the first set (the "baby", "milk", "primary" or "deciduous" set) normally starts to appear at about six months of age, although some babies are born with one or more visible teeth, known as neonatal teeth. Normal tooth eruption at about six months is known as teething and can be painful. Kangaroos, elephants, and manatees are unusual among mammals because they are polyphyodonts.

Aardvark

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In aardvarks, teeth lack enamel and have many pulp tubules, hence the name of the order Tubulidentata.[11]

Canines

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In dogs, the teeth are less likely than humans to form dental cavities because of the very high pH of dog saliva, which prevents enamel from demineralizing.[12] Sometimes called cuspids, these teeth are shaped like points (cusps) and are used for tearing and grasping food.[13]

Cetaceans

[edit]
Main article: Baleen

Like human teeth, whale teeth have polyp-like protrusions located on the root surface of the tooth. These polyps are made of cementum in both species, but in human teeth, the protrusions are located on the outside of the root, while in whales the nodule is located on the inside of the pulp chamber. While the roots of human teeth are made of cementum on the outer surface, whales have cementum on the entire surface of the tooth with a very small layer of enamel at the tip. This small enamel layer is only seen in older whales where the cementum has been worn away to show the underlying enamel.[14]

The toothed whale is a parvorder of the cetaceans characterized by having teeth. The teeth differ considerably among the species. They may be numerous, with some dolphins bearing over 100 teeth in their jaws. On the other hand, the narwhals have a giant unicorn-like tusk, which is a tooth containing millions of sensory pathways and used for sensing during feeding, navigation, and mating. It is the most neurologically complex tooth known. Beaked whales are almost toothless, with only bizarre teeth found in males. These teeth may be used for feeding but also for demonstrating aggression and showmanship.

Primates

[edit]
Main articles: Human tooth and Dental anatomy

In humans (and most other primates), there are usually 20 primary (also "baby" or "milk") teeth, and later up to 32 permanent teeth. Four of these 32 may be third molars or wisdom teeth, although these are not present in all adults, and may be removed surgically later in life.[15]

Among primary teeth, 10 of them are usually found in the maxilla (i.e. upper jaw) and the other 10 in the mandible (i.e. lower jaw). Among permanent teeth, 16 are found in the maxilla and the other 16 in the mandible. Most of the teeth have uniquely distinguishing features.

Horse

[edit]
Main article: Horse teeth

An adult horse has between 36 and 44 teeth. The enamel and dentin layers of horse teeth are intertwined.[16] All horses have 12 premolars, 12 molars, and 12 incisors.[17] Generally, all male equines also have four canine teeth (called tushes) between the molars and incisors. However, few female horses (less than 28%) have canines, and those that do usually have only one or two, which many times are only partially erupted.[18] A few horses have one to four wolf teeth, which are vestigial premolars, with most of those having only one or two. They are equally common in male and female horses and much more likely to be on the upper jaw. If present these can cause problems as they can interfere with the horse's bit contact. Therefore, wolf teeth are commonly removed.[17]

Horse teeth can be used to estimate the animal's age. Between birth and five years, age can be closely estimated by observing the eruption pattern on milk teeth and then permanent teeth. By age five, all permanent teeth have usually erupted. The horse is then said to have a "full" mouth. After the age of five, age can only be conjectured by studying the wear patterns on the incisors, shape, the angle at which the incisors meet, and other factors. The wear of teeth may also be affected by diet, natural abnormalities, and cribbing. Two horses of the same age may have different wear patterns.

A horse's incisors, premolars, and molars, once fully developed, continue to erupt as the grinding surface is worn down through chewing. A young adult horse will have teeth, which are 110–130 mm (4.5–5 inches) long, with the majority of the crown remaining below the gumline in the dental socket. The rest of the tooth will slowly emerge from the jaw, erupting about 3 mm (1⁄8 in) each year, as the horse ages. When the animal reaches old age, the crowns of the teeth are very short and the teeth are often lost altogether. Very old horses, if lacking molars, may need to have their fodder ground up and soaked in water to create a soft mush for them to eat in order to obtain adequate nutrition.

Proboscideans

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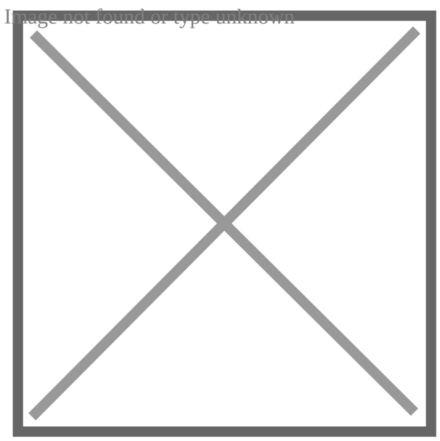

Section through the ivory tusk of a mammoth

Main article: Elephant ivory

Elephants' tusks are specialized incisors for digging food up and fighting. Some elephant teeth are similar to those in manatees, and elephants are believed to have undergone an aquatic phase in their evolution.

At birth, elephants have a total of 28 molar plate-like grinding teeth not including the tusks. These are organized into four sets of seven successively larger teeth which the elephant will slowly wear through during its lifetime of chewing rough plant material. Only four teeth are used for chewing at a given time, and as each tooth wears out, another tooth moves forward to take its place in a process similar to a conveyor belt. The last and largest of these teeth usually becomes exposed when the animal is around 40 years of age, and will often last for an additional 20 years. When the last of these teeth has fallen out, regardless of the elephant's age, the animal will no longer be able to chew food and will die of starvation.[19][20]

Rabbit

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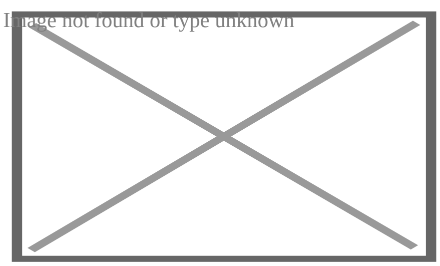
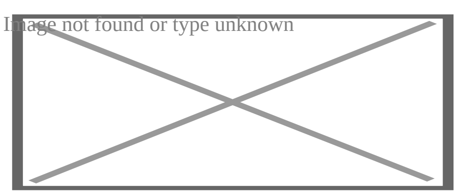
Rabbits and other lagomorphs usually shed their deciduous teeth before (or very shortly after) their birth, and are usually born with their permanent teeth.[21] The teeth of rabbits complement their diet, which consists of a wide range of vegetation. Since many of the foods are abrasive enough to cause attrition, rabbit teeth grow continuously throughout life.[22] Rabbits have a total of six incisors, three upper premolars, three upper molars, two lower premolars, and two lower molars on each side. There are no canines. Dental formula is $\frac{2.0.3.3}{1.0.2.3}$ = 28. Three to four millimeters of the tooth is worn away by incisors every week, whereas the cheek teeth require a month to wear away the same amount.[23]

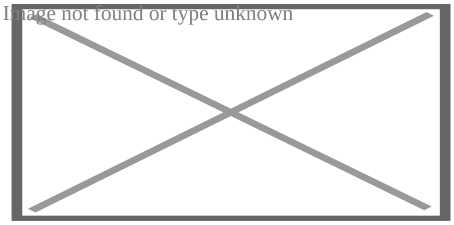
The incisors and cheek teeth of rabbits are called aradicular hypsodont teeth. This is sometimes referred to as an elodent dentition. These teeth grow or erupt continuously. The growth or eruption is held in balance by dental abrasion from chewing a diet high in fiber.



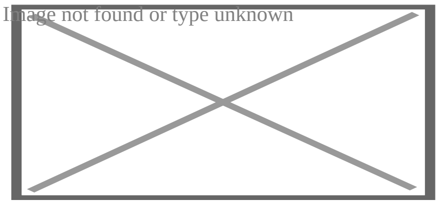
Buccal view of top incisor from *Rattus rattus*. Top incisor outlined in yellow. Molars circled in blue.



Buccal view of the lower incisor from the right dentary of a *Rattus rattus*



Lingual view of the lower incisor from the right dentary of a *Rattus rattus*



Midsagittal view of top incisor from *Rattus rattus*. Top incisor outlined in yellow. Molars circled in blue.

Rodents

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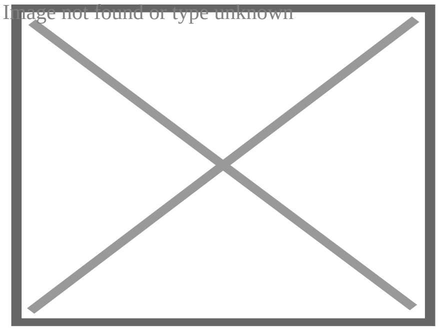
Rodents have upper and lower hypselodont incisors that can continuously grow enamel throughout its life without having properly formed roots.[24] These teeth are also known as aradicular teeth, and unlike humans whose ameloblasts die after tooth development, rodents continually produce enamel, they must wear down their teeth by gnawing on various materials.[25] Enamel and dentin are produced by the enamel organ, and growth is dependent on the presence of stem cells, cellular amplification, and cellular maturation structures in the odontogenic region.[26] Rodent incisors are used for cutting wood, biting through the skin of fruit, or for defense. This allows for the rate of wear and tooth growth to be at equilibrium.[24] The microstructure of rodent incisor enamel has shown to be useful in studying the phylogeny and systematics of rodents because of its independent evolution from the other dental traits. The enamel on rodent incisors are composed of two layers: the inner portio interna (PI) with Hunter–Schreger bands (HSB) and an outer portio externa (PE) with radial enamel (RE).[27] It usually involves the differential regulation of the epithelial stem cell niche in the tooth of two rodent species, such as guinea pigs.[28][29]



Lingual view of top incisor from Rattus rattus. Top incisor outlined in yellow. Molars circled in blue.

The teeth have enamel on the outside and exposed dentin on the inside, so they self-sharpen during gnawing. On the other hand, continually growing molars are found in some rodent species, such as the sibling vole and the guinea pig.[28][29] There is variation in the dentition of the rodents, but generally, rodents lack canines and premolars, and have a space between their incisors and molars, called the diastema region.

Manatee

[edit]

Manatees are polyphyodont with mandibular molars developing separately from the jaw and are encased in a bony shell separated by soft tissue.[30][31]

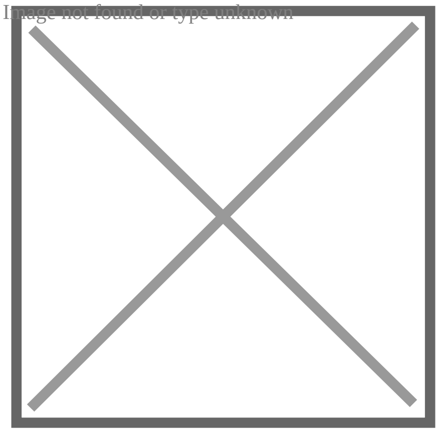
Walrus

[edit]
Main article: Walrus ivory

Walrus tusks are canine teeth that grow continuously throughout life.[32]

Fish

[edit]



Teeth of a great white shark

See also: Pharyngeal teeth and Shark tooth

Fish, such as sharks, may go through many teeth in their lifetime. The replacement of multiple teeth is known as polyphyodontia.

A class of prehistoric shark are called cladodonts for their strange forked teeth.

Unlike the continuous shedding of functional teeth seen in modern sharks,[33][34] the majority of stem chondrichthyan lineages retained all tooth generations developed throughout the life of the animal.[35] This replacement mechanism is exemplified by the tooth whorl-based dentitions of acanthodians,[36] which include the oldest known toothed vertebrate, *Qianodus duplicis*[37].

Amphibians

[edit]

All amphibians have pedicellate teeth, which are modified to be flexible due to connective tissue and uncalcified dentine that separates the crown from the base of the tooth.[38]

Most amphibians exhibit teeth that have a slight attachment to the jaw or acrodont teeth. Acrodont teeth exhibit limited connection to the dentary and have little enervation.[39] This is ideal for organisms who mostly use their teeth for grasping, but not for crushing and allows for rapid regeneration of teeth at a low energy cost.

Teeth are usually lost in the course of feeding if the prey is struggling. Additionally, amphibians that undergo a metamorphosis develop bicuspid shaped teeth.[40]

Reptiles

[edit]

The teeth of reptiles are replaced constantly throughout their lives. Crocodilian juveniles replace teeth with larger ones at a rate as high as one new tooth per socket every month. Once mature, tooth replacement rates can slow to two years and even longer. Overall, crocodilians may use 3,000 teeth from birth to death. New teeth are created within old teeth.[41]

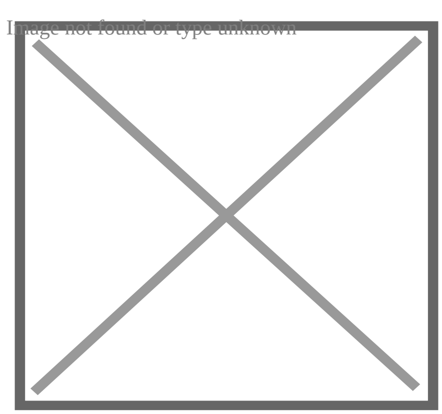
Birds

[edit]
Main article: Ichthyornis

A skull of Ichthyornis discovered in 2014 suggests that the beak of birds may have evolved from teeth to allow chicks to escape their shells earlier, and thus avoid predators and also to penetrate protective covers such as hard earth to access underlying food.[42][43]

Invertebrates

[edit]

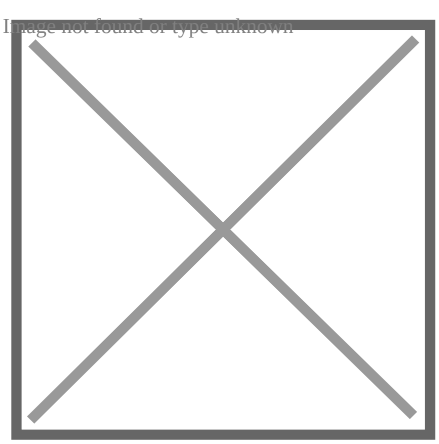


The European medicinal leech has three jaws with numerous sharp teeth which function like little saws for incising a host.

True teeth are unique to vertebrates,[44] although many invertebrates have analogous structures often referred to as teeth. The organisms with the simplest genome bearing such tooth-like structures are perhaps the parasitic worms of the family Ancylostomatidae.[45] For example, the hookworm *Necator americanus* has two dorsal and two ventral cutting plates or teeth around the anterior margin of the buccal capsule. It also has a pair of subdorsal and a pair of subventral teeth located close to the rear.[46]

Historically, the European medicinal leech, another invertebrate parasite, has been used in medicine to remove blood from patients.[47] They have three jaws (tripartite) that resemble saws in both appearance and function, and on them are about 100 sharp teeth used to incise the host. The incision leaves a mark that is an inverted Y inside of a circle. After piercing the skin and injecting anticoagulants (hirudin) and anaesthetics, they suck out blood, consuming up to ten times their body weight in a single meal.[48]

In some species of Bryozoa, the first part of the stomach forms a muscular gizzard lined with chitinous teeth that crush armoured prey such as diatoms. Wave-like peristaltic contractions then move the food through the stomach for digestion.[49]



The limpet rasps algae from rocks using teeth with the strongest known tensile strength of any biological material.

Molluscs have a structure called a radula, which bears a ribbon of chitinous teeth. However, these teeth are histologically and developmentally different from vertebrate teeth and are unlikely to be homologous. For example, vertebrate teeth develop from a neural crest mesenchyme-derived dental papilla, and the neural crest is specific to vertebrates, as are tissues such as enamel.[44]

The radula is used by molluscs for feeding and is sometimes compared rather inaccurately to a tongue. It is a minutely toothed, chitinous ribbon, typically used for scraping or cutting food before the food enters the oesophagus. The radula is unique to molluscs, and is found in every class of mollusc apart from bivalves.

Within the gastropods, the radula is used in feeding by both herbivorous and carnivorous snails and slugs. The arrangement of teeth (also known as denticles) on the radula ribbon varies considerably from one group to another as shown in the diagram on the left.

Predatory marine snails such as the Naticidae use the radula plus an acidic secretion to bore through the shell of other molluscs. Other predatory marine snails, such as the Conidae, use a specialized radula tooth as a poisoned harpoon. Predatory pulmonate land slugs, such as the ghost slug, use elongated razor-sharp teeth on the radula to seize and devour earthworms. Predatory cephalopods, such as squid, use the radula for cutting prey.

In most of the more ancient lineages of gastropods, the radula is used to graze by scraping diatoms and other microscopic algae off rock surfaces and other substrates. Limpets scrape algae from rocks using radula equipped with exceptionally hard rasping teeth.[50] These teeth have the strongest known tensile strength of any biological material, outperforming spider silk.[50] The mineral protein of the limpet teeth can withstand a tensile stress of 4.9 GPa, compared to 4 GPa of spider silk and 0.5 GPa of human teeth.[51]

Fossilization and taphonomy

[edit]

Because teeth are very resistant, often preserved when bones are not,[52] and reflect the diet of the host organism, they are very valuable to archaeologists and palaeontologists.[53] Early fish such as the thelodonts had scales composed of dentine and an enamel-like compound, suggesting that the origin of teeth was from scales which were retained in the mouth. Fish as early as the late Cambrian had dentine in their exoskeletons, which may have functioned in defense or for sensing their environments.[54] Dentine can be as hard as the rest of teeth and is composed of collagen fibres, reinforced with hydroxyapatite.[54]

Though teeth are very resistant, they also can be brittle and highly susceptible to cracking.[55] However, cracking of the tooth can be used as a diagnostic tool for predicting bite force. Additionally, enamel fractures can also give valuable insight into the diet and behaviour of archaeological and fossil samples.

Decalcification removes the enamel from teeth and leaves only the organic interior intact, which comprises dentine and cementine.[56] Enamel is quickly decalcified in acids,[57] perhaps by dissolution by plant acids or via diagenetic solutions, or in the stomachs of vertebrate predators.[56] Enamel can be lost by abrasion or spalling,[56] and is lost before dentine or bone are destroyed by the fossilisation process.[57] In such a case, the 'skeleton' of the teeth would consist of the dentine, with a hollow pulp cavity.[56] The organic part of dentine, conversely, is destroyed by alkalis.[57]

See also

[edit]

- icon Image not found or type unknown Medicine portal
- Animal tooth development
- Dragon's teeth (mythology)

References

[edit]

1. ^ ***a b c*** *Romer, Alfred Sherwood; Parsons, Thomas S. (1977). The Vertebrate Body. Philadelphia, PA: Holt-Saunders International. pp. 300–310. ISBN 978-0-03-910284-5.*
2. **^** *Tummers M, Thesleff I (March 2003). "Root or crown: a developmental choice orchestrated by the differential regulation of the epithelial stem cell niche in the tooth of two rodent species". Development.* ***130*** *(6): 1049–57. doi: 10.1242/dev.00332. PMID 12571097.*
3. **^** *Hunt AM (1959). "A description of the molar teeth and investing tissues of normal guinea pigs". J. Dent. Res.* ***38*** *(2): 216–31. doi:10.1177/00220345590380020301. PMID 13641521. S2CID 45097018.*
4. ^ ***a b*** *Nasoori, Alireza (2020). "Tusks, the extra-oral teeth". Archives of Oral Biology.* ***117****: 104835. doi:10.1016/j.archoralbio.2020.104835. PMID 32668361. S2CID 220585014.*
5. **^** *McCOLLUM, MELANIE; SHARPE, PAUL T. (July 2001). "Evolution and development of teeth". Journal of Anatomy.* ***199*** *(1–2): 153–159. doi:10.1046/j.1469-7580.2001.19910153.x. PMC 1594990. PMID 11523817.*
6. **^** *Kaplan, Matt (October 16, 2013). "Fossil scans reveal origins of teeth". Nature. doi:10.1038/nature.2013.13964 – via www.nature.com.*
7. **^** *Harper, Douglas (2001–2021). "tooth | Origin and meaning of tooth". Online Etymology Dictionary.*
8. **^** *Jheon, Andrew H (2012). "From molecules to mastication: the development and evolution of teeth". Wiley Interdiscip Rev Dev Biol.* ***2*** *(2): 165–182. doi:10.1002/wdev.63. PMC 3632217. PMID 24009032.*
9. **^** *Sharpe, P. T. (2001). "Fish scale development: Hair today, teeth and scales yesterday?". Current Biology.* ***11*** *(18): R751 – R752. Bibcode:2001CBio...11.R751S. doi:10.1016/S0960-9822(01)00438-9. PMID 11566120. S2CID 18868124.*
10. **^** *Jennifer Viegas (June 24, 2015). "First-known teeth belonged to fierce fish". ABC Science. Retrieved June 28, 2015.*
11. **^** Shoshani 2002, p. 619
12. **^** *Hale, FA (2009). "Dental caries in the dog". Can. Vet. J.* ***50*** *(12): 1301–4. PMC 2777300. PMID 20190984.*
13. **^** *"Types of Teeth, Dental Anatomy & Tooth Anatomy | Colgate®". www.colgate.com. Archived from the original on 2017-11-19. Retrieved 2017-11-19.*
14. **^** *"Common Characteristics Of Whale Teeth". Archived from the original on 4 September 2011. Retrieved 18 July 2014.*

15. **^** *"Everything you need to know about teeth". NHS Scotland. Retrieved 5 May 2020.*
16. **^** *"Gummed Out: Young Horses Lose Many Teeth, Vet Says". Archived from the original on 8 July 2014. Retrieved 6 July 2014.*
17. ^ ***a b*** *Patricia Pence (2002). Equine Dentistry: A Practical Guide. Baltimore: Lippincott Williams & Wilkins. ISBN 978-0-683-30403-9.*
18. **^** *Al Cirelli. "Equine Dentition" (PDF). University of Nevada Reno. SP-00-08. Retrieved 7 June 2010.*
19. **^** *Maurice Burton; Robert Burton (2002). International Wildlife Encyclopedia. Marshall Cavendish. p. 769. ISBN 978-0-7614-7266-7.*
20. **^** Bram, L. et al. MCMLXXXIII. *Elephants.* Funk & Wagnalls New Encyclopedia, Volume 9, p. 183. ISBN 0-8343-0051-6
21. **^** *"Dental Anatomy & Care for Rabbits and Rodents".*
22. **^** Brown, Susan. Rabbit Dental Diseases Archived 2007-10-14 at the Wayback Machine, hosted on the San Diego Chapter of the House Rabbit Society Archived 2007-10-13 at the Wayback Machine. Page accessed April 9, 2007.
23. **^** Ry�avy, Robin. Hay & Dental Health, hosted by the Missouri House Rabbit Society-Kansas City. Page accessed January 2, 2024.
24. ^ ***a b*** *Cox, Philip; Hautier, Lionel (2015). Evolution of the Rodents: Advances in Phylogeny, Functional Morphology and Development. Cambridge University Press. p. 482. ISBN 9781107044333.*
25. **^** Caceci, Thomas. *Veterinary Histology* with subtitle "Digestive System: Oral Cavity" found here Archived 2006-04-30 at the Wayback Machine.
26. **^** *Gomes, J.r.; Omar, N.f.; Do Carmo, E.r.; Neves, J.s.; Soares, M.a.m.; Narvaes, E.a.; Novaes, P.d. (30 April 2013). "Relationship Between Cell Proliferation and Eruption Rate in the Rat Incisor". The Anatomical Record.* ***296*** *(7): 1096–1101. doi:10.1002/ar.22712. ISSN 1932-8494. PMID 23629828. S2CID 13197331.*
27. **^** *Martin, Thomas (September 1999). "Evolution of Incisor Enamel Microstructure in Theridomyidae (Rodentia)". Journal of Vertebrate Paleontology.* ***19*** *(3): 550. Bibcode:1999JVPal..19..550M. doi:10.1080/02724634.1999.10011164.*
28. ^ ***a b*** Tummers M and Thesleff I. Root or crown: a developmental choice orchestrated by the differential regulation of the epithelial stem cell niche in the tooth of two rodent species. Development (2003). 130(6):1049-57.
29. ^ ***a b*** AM Hunt. A description of the molar teeth and investing tissues of normal guinea pigs. J Dent Res. (1959) 38(2):216-31.

30. ^ *Shoshani, J., ed. (2000). Elephants: Majestic Creatures of the Wild. Checkmark Books. ISBN 0-87596-143-6.*
31. ^ *Best, Robin (1984). Macdonald, D. (ed.). The Encyclopedia of Mammals. New York: Facts on File. pp. 292–298. ISBN 0-87196-871-1.*
32. ^ The Permanent Canine Teeth, hosted on the University of Illinois at Chicago website. Page accessed February 5, 2007.
33. ^ *Underwood, Charlie; Johanson, Zerina; Smith, Moya Meredith (November 2016). "Cutting blade dentitions in squaliform sharks form by modification of inherited alternate tooth ordering patterns". Royal Society Open Science. **3** (11): 160385. Bibcode:2016RSOS....360385U. doi:10.1098/rsos.160385. ISSN 2054-5703. PMC 5180115. PMID 28018617. S2CID 12821592.*
34. ^ *Fraser, Gareth J.; Thiery, Alex P. (2019), Underwood, Charlie; Richter, Martha; Johanson, Zerina (eds.), "Evolution, Development and Regeneration of Fish Dentitions", Evolution and Development of Fishes, Cambridge: Cambridge University Press, pp. 160–171, doi:10.1017/9781316832172.010, ISBN 978-1-107-17944-8, S2CID 92225621, retrieved 2022-10-22*
35. ^ *Rücklin, Martin; King, Benedict; Cunningham, John A.; Johanson, Zerina; Marone, Federica; Donoghue, Philip C. J. (2021-05-06). "Acanthodian dental development and the origin of gnathostome dentitions". Nature Ecology & Evolution. **5** (7): 919–926. Bibcode:2021NatEE...5..919R. doi:10.1038/s41559-021-01458-4. hdl:1983/27f9a13a-1441-410e-b9a7-116b42cd40f7. ISSN 2397-334X. PMID 33958756. S2CID 233985000.*
36. ^ *Burrow, Carole (2021). Acanthodii, Stem Chondrichthyes. Verlag Dr. Friedrich Pfeil. ISBN 978-3-89937-271-7. OCLC 1335983356.*
37. ^ *Andreev, Plamen S.; Sansom, Ivan J.; Li, Qiang; Zhao, Wenjin; Wang, Jianhua; Wang, Chun-Chieh; Peng, Lijian; Jia, Liantao; Qiao, Tuo; Zhu, Min (September 2022). "The oldest gnathostome teeth". Nature. **609** (7929): 964–968. Bibcode:2022Natur.609..964A. doi:10.1038/s41586-022-05166-2. ISSN 1476-4687. PMID 36171375. S2CID 252569771.*
38. ^ Pough, Harvey. Vertebrate Life. 9th Ed. Boston: Pearson Education, Inc., 2013. 211–252. Print.
39. ^ Kardong, Kenneth (1995). *Vertebrate: Comparative Anatomy, Function, Evolution*. New York: McGraw-Hlll. pp. 215–225. ISBN 9780078023026.
40. ^ Xiong, Jianli (2014). "Comparison of vomerine tooth rows in juvenile and adult Hynobius guabangshanensis". *Vertebrate Zoology*. **64**: 215–220.
41. ^ *Poole, D. F. G. (January 1961). "Notes on Tooth Replacement in the Nile Crocodile Crocodilus niloticus". Proceedings of the Zoological Society of London. **136** (1): 131–140. doi:10.1111/j.1469-7998.1961.tb06083.x.*

42. **^** Hersher, Rebecca (May 2, 2018). "How Did Birds Lose Their Teeth And Get Their Beaks? Study Offers Clues". NPR.
43. **^** Field, Daniel J.; Hanson, Michael; Burnham, David; Wilson, Laura E.; Super, Kristopher; Ehret, Dana; Ebersole, Jun A.; Bhullar, Bhart-Anjan S. (May 31, 2018). "Complete Ichthyornis skull illuminates mosaic assembly of the avian head". *Nature* Vol 557, pp 96 – 100.
44. ^ ***a b*** *Kardong, Kenneth V. (1995). Vertebrates: comparative anatomy, function, evolution. McGraw-Hill. pp. 55, 57. ISBN 978-0-697-21991-6.*
45. **^** *"Ancylostoma duodenale". Nematode.net Genome Sequencing Center. Archived from the original on 2008-05-16. Retrieved 2009-10-27.*
46. **^** Roberts, Larry S., and John Janovy, Jr. Foundations of Parasitology. Seventh ed. Singapore: McGraw-Hill, 2006.
47. **^** *Brian Payton (1981). Kenneth Muller; John Nicholls; Gunther Stent (eds.). Neurobiology of the Leech. New York: Cold Spring Harbor Laboratory. pp. 27–34. ISBN 978-0-87969-146-2.*
48. **^** *Wells MD, Manktelow RT, Boyd JB, Bowen V (1993). "The medical leech: an old treatment revisited". Microsurgery.* ***14*** *(3): 183–6. doi:10.1002/micr.1920140309. PMID 8479316. S2CID 27891377.*
49. **^** *Ruppert, E.E.; Fox, R.S.; Barnes, R.D. (2004). "Lophoporata". Invertebrate Zoology (7 ed.). Brooks / Cole. pp. 829–845. ISBN 978-0-03-025982-1.*
50. ^ ***a b*** *Asa H. Barber; Dun Lu; Nicola M. Pugno (18 February 2015), "Extreme strength observed in limpet teeth", Journal of the Royal Society Interface,* ***12*** *(105): 20141326, doi:10.1098/rsif.2014.1326, PMC 4387522, PMID 25694539*
51. **^** *Zachary Davies Boren (18 February 2015). "The strongest materials in the world: Limpet teeth beats record resistance of spider silk". The Independent. Retrieved 20 February 2015.*
52. **^** *Taphonomy: A Process Approach*. Ronald E. Martin. Illustrated edition. Cambridge University Press, 1999. ISBN 978-0-521-59833-0
53. **^** *Towle, Ian; Irish, Joel D.; De Groote, Isabelle (2017). "Behavioral inferences from the high levels of dental chipping in Homo naledi". American Journal of Physical Anthropology.* ***164*** *(1): 184–192. doi:10.1002/ajpa.23250. PMID 28542710. S2CID 24296825. Retrieved 2019-01-09.*
54. ^ ***a b*** Teaford, Mark F and Smith, Moya Meredith, 2007. *Development, Function and Evolution of Teeth*, Cambridge University Press. ISBN 978-0-521-03372-5, Chapter 5.

55. **^** *Lee, James J.-W.; Constantino, Paul J.; Lucas, Peter W.; Lawn, Brian R. (2011-11-01). "Fracture in teeth—a diagnostic for inferring bite force and tooth function". Biological Reviews.* ***86*** *(4): 959–974. doi:10.1111/j.1469-185x.2011.00181.x. ISSN 1469-185X. PMID 21507194. S2CID 205599560.*
56. ^ ***a b c d*** *Fisher, Daniel C (1981). "Taphonomic Interpretation of Enamel-Less Teeth in the Shotgun Local Fauna (Paleocene, Wyoming)". Museum of Paleontology Contributions, the University of Michigan.* ***25*** *(13): 259–275. hdl:2027.42/48503.*
57. ^ ***a b c*** *Fernandez-Jalvo, Y.; Sanchez-Chillon, B.; Andrews, P.; Fernandez-Lopez, S.; Alcala Martinez, L. (2002). "Morphological taphonomic transformations of fossil bones in continental environments, and repercussions on their chemical composition" (PDF). Archaeometry.* ***44*** *(3): 353–361. doi:10.1111/1475-4754.t01-1-00068.*

Sources

[edit]

- *Shoshani, Jeheskel (2002). "Tubulidentata". In Robertson, Sarah (ed.). Encyclopedia of Life Sciences. Vol. 18: Svedberg, Theodor to Two-hybrid and Related Systems. London, UK: Nature Publishing Group. ISBN 978-1-56159-274-6.*

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