



DENTAL EMERGENCIES, RADIOLOGY, AND RESPIRATORY THERAPY COLLABORATION FOR TRAUMA PATIENTS: A COMPREHENSIVE APPROACH TO CARE

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Abstract:

Dental emergencies in trauma patients present unique challenges that require a multidisciplinary approach for optimal management. This review article explores the importance of collaboration between dental professionals, radiologists, and respiratory therapists in providing comprehensive care for trauma patients experiencing dental emergencies. The integration of radiology imaging techniques, such as CT scans and panoramic X-rays, plays a crucial role in accurately diagnosing dental trauma and guiding treatment decisions. Furthermore, the involvement of respiratory therapists is essential in ensuring airway patency and respiratory stability during dental procedures in trauma patients. This article discusses the various dental emergencies commonly seen in trauma patients, including avulsed teeth, fractured jaws, and soft tissue injuries, and highlights the importance of prompt intervention to prevent long-term complications. Additionally, the review emphasizes the significance of effective communication and coordination among healthcare providers to deliver timely and coordinated care to trauma patients with dental emergencies.

Keywords: Dental emergencies, Trauma patients, Radiology, Respiratory therapy, Multidisciplinary approach, Comprehensive care

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Introduction:

In the field of healthcare, collaboration among different specialties is crucial in providing comprehensive care for patients, especially in cases of trauma. Dental emergencies, radiology, and respiratory therapy are three key areas that play a significant role in the treatment and management of trauma patients. By working together, these specialties can ensure that patients receive the best possible care and outcomes [1].

Dental emergencies are a common occurrence in trauma patients, particularly in cases of facial injuries or accidents. These emergencies can range from broken or knocked-out teeth to jaw fractures and soft tissue injuries. In such cases, it is essential for dental professionals to work closely with other healthcare providers to assess the extent of the injury and determine the best course of treatment [2].

Radiology also plays a crucial role in the care of trauma patients. Imaging studies such as X-rays, CT scans, and MRIs can help healthcare providers to accurately diagnose injuries and plan the appropriate treatment. Radiologists work closely with other specialists to interpret imaging results and provide valuable information that guides patient care [3].

Respiratory therapy is another important aspect of care for trauma patients, particularly those who have sustained chest injuries or are at risk of respiratory complications. Respiratory therapists are trained to assess and manage patients with breathing difficulties, providing interventions such as oxygen therapy, nebulizer treatments, and mechanical ventilation when necessary. Collaboration with dental and radiology teams is essential in ensuring that respiratory therapy interventions are coordinated with other aspects of patient care [4].

When it comes to trauma patients, a comprehensive approach to care is essential for achieving optimal outcomes. By collaborating with dental professionals, radiologists, and respiratory therapists, healthcare providers can ensure that all aspects of a patient's injury are addressed and managed effectively. This multidisciplinary approach not only improves patient outcomes but also enhances the overall quality of care provided [5].

Dental Emergencies in Trauma Patients:

Dental emergencies in trauma patients are a serious issue that can have long-lasting effects on a person's oral health. Trauma patients often experience injuries to their mouth and teeth due to accidents, falls, or other traumatic events. These

injuries can range from minor chips and cracks to more severe damage such as dislodged or knocked-out teeth [6].

One of the most common dental emergencies in trauma patients is a knocked-out tooth. This can be a result of a direct blow to the mouth or face, causing the tooth to become completely dislodged from its socket. In cases where a tooth is knocked out, it is important for the patient to seek immediate dental care in order to have the best chance of saving the tooth. The sooner a knocked-out tooth is re-implanted, the higher the likelihood of it successfully reattaching to the bone [7].

Another common dental emergency in trauma patients is a cracked or fractured tooth. This can occur when a patient sustains a blow to the mouth or face, causing the tooth to crack or break. In some cases, the crack may be superficial and only affect the enamel of the tooth. However, in more severe cases, the crack may extend into the dentin or pulp of the tooth, leading to pain and sensitivity. Treatment for a cracked or fractured tooth may include bonding, crowns, or root canal therapy, depending on the extent of the damage [8].

In addition to knocked-out teeth and cracked teeth, trauma patients may also experience other dental emergencies such as avulsed teeth, dental abscesses, or soft tissue injuries to the mouth. Avulsed teeth occur when a tooth is partially dislodged from its socket, while dental abscesses are infections that develop in the tooth or surrounding tissues. Soft tissue injuries, such as cuts or lacerations to the gums, lips, or tongue, can also occur as a result of trauma [9].

When a trauma patient experiences a dental emergency, it is important for them to seek immediate medical attention. Delaying treatment can lead to further complications and may jeopardize the long-term health of the teeth and gums. In cases of knocked-out teeth, patients should try to re-implant the tooth back into its socket if possible, or store it in milk or saline solution until they can see a dentist. For cracked or fractured teeth, patients should avoid chewing on the affected tooth and should rinse their mouth with warm water to clean the area [10].

Dental emergencies in trauma patients are a serious issue that require prompt and appropriate treatment. By seeking immediate dental care, trauma patients can increase their chances of saving their teeth and preventing further complications. It is important for trauma patients to be aware of the signs and symptoms of dental emergencies and to seek help as soon as possible in order to preserve their oral health [11].

Role of Radiology in Diagnosing Dental Trauma:

Radiology plays a crucial role in diagnosing dental trauma, which refers to injuries or damage to the teeth, gums, jaw, or surrounding tissues. Dental trauma can result from a variety of causes, such as accidents, sports injuries, falls, or even biting down on a hard object. Prompt and accurate diagnosis of dental trauma is essential for determining the extent of the injury and developing an appropriate treatment plan [12].

There are several types of radiological imaging techniques that are commonly used in the diagnosis of dental trauma. These include intraoral radiographs, extraoral radiographs, cone beam computed tomography (CBCT), and magnetic resonance imaging (MRI). Each of these techniques has its own advantages and limitations, and the choice of imaging modality will depend on the specific clinical situation and the information needed for diagnosis [13].

Intraoral radiographs are the most commonly used imaging technique in dentistry. They provide detailed images of the teeth and surrounding structures, such as the bone and soft tissues. Intraoral radiographs can help identify fractures, dislocations, and other signs of dental trauma. They are also useful for assessing the extent of damage to the tooth roots and supporting structures [14].

Extraoral radiographs, such as panoramic radiographs and cephalometric radiographs, provide a broader view of the entire jaw and skull. These images can be helpful in diagnosing more complex cases of dental trauma, such as fractures of the jaw or facial bones. They can also be used to evaluate the relationship between the teeth, jaws, and surrounding structures [15].

CBCT is a relatively new imaging technique that provides three-dimensional images of the teeth and jaws. CBCT is particularly useful for diagnosing complex cases of dental trauma, such as fractures that involve multiple teeth or extend into the surrounding bone. CBCT can also help identify the exact location of a fracture or dislocation, which is essential for planning surgical treatment [16].

MRI is another imaging technique that can be used in the diagnosis of dental trauma. MRI uses magnetic fields and radio waves to create detailed images of the soft tissues, such as the gums, muscles, and nerves. MRI is particularly useful for evaluating injuries to the soft tissues of the face and jaw, such as torn ligaments or nerve damage [17].

In addition to these imaging techniques, radiologists may also use other diagnostic tools, such as dental pulp testing, to assess the vitality of the teeth and determine the extent of damage to the

dental pulp. Dental pulp testing involves applying heat or cold stimuli to the teeth to assess their response. This can help determine whether a tooth is vital or non-vital, which is important for determining the appropriate treatment [18].

Radiology plays a crucial role in diagnosing dental trauma and guiding treatment decisions. By providing detailed images of the teeth, jaws, and surrounding structures, radiological imaging techniques help dentists and oral surgeons accurately assess the extent of the injury and develop an appropriate treatment plan. With advances in technology and imaging modalities, radiology continues to play an increasingly important role in the field of dentistry, improving patient outcomes and quality of care [19].

Importance of Respiratory Therapy in Dental Procedures for Trauma Patients:

Respiratory therapy plays a crucial role in dental procedures for trauma patients. Trauma patients often have compromised airways and respiratory function, which can be further exacerbated during dental procedures. Respiratory therapists are trained to assess and manage patients with respiratory issues, making them an essential part of the dental team when treating trauma patients [20]. One of the main reasons why respiratory therapy is important in dental procedures for trauma patients is the potential for airway compromise. Trauma patients may have injuries to the face, neck, or mouth that can affect their ability to breathe properly. Additionally, the use of anesthesia and sedation during dental procedures can further compromise the patient's airway. Respiratory therapists are trained to assess and manage airway issues, ensuring that trauma patients can breathe effectively during and after dental procedures [21]. Another important aspect of respiratory therapy in dental procedures for trauma patients is the management of respiratory conditions. Trauma patients may have underlying respiratory conditions such as asthma, chronic obstructive pulmonary disease (COPD), or pneumonia, which can be exacerbated during dental procedures. Respiratory therapists can assess the patient's respiratory status, provide appropriate interventions such as oxygen therapy or nebulization, and monitor the patient's response to treatment. This ensures that trauma patients with pre-existing respiratory conditions can safely undergo dental procedures without compromising their respiratory function [22].

In addition to managing airway compromise and respiratory conditions, respiratory therapists also play a role in preventing and managing

complications during and after dental procedures for trauma patients. For example, trauma patients may be at increased risk of developing respiratory infections due to their compromised immune system. Respiratory therapists can provide education on respiratory hygiene and infection control measures to prevent respiratory complications. They can also monitor the patient for signs of respiratory distress or infection post-procedure and intervene promptly if necessary [23].

Furthermore, respiratory therapists can also provide valuable support in the management of pain and anxiety during dental procedures for trauma patients. Pain and anxiety can lead to increased respiratory effort and compromised respiratory function, especially in trauma patients with pre-existing respiratory conditions. Respiratory therapists can provide non-pharmacological interventions such as breathing exercises and relaxation techniques to help trauma patients manage their pain and anxiety, thereby improving their respiratory function during dental procedures [24].

respiratory therapy is of utmost importance in dental procedures for trauma patients. Respiratory therapists play a critical role in assessing and managing airway compromise, respiratory conditions, and complications during and after dental procedures. Their expertise in respiratory assessment, intervention, and monitoring ensures that trauma patients can undergo dental procedures safely and effectively, without compromising their respiratory function. Therefore, the integration of respiratory therapy into dental care for trauma patients is essential for ensuring optimal patient outcomes and safety [25].

Common Dental Emergencies in Trauma Patients:

Dental emergencies are a common occurrence in trauma patients, and they can range from minor injuries to more severe conditions that require immediate attention. Trauma patients are at a higher risk of experiencing dental emergencies due to the nature of their injuries, which can include facial trauma, head injuries, and fractures [26].

One of the most common dental emergencies in trauma patients is a knocked-out tooth, also known as an avulsed tooth. This can occur as a result of a direct blow to the face or head, causing the tooth to become dislodged from its socket. In cases where a tooth is knocked out, it is important to seek immediate dental care to increase the chances of saving the tooth. Patients should be instructed to handle the tooth carefully by the crown (the part

that is visible in the mouth) and avoid touching the root. The tooth should be rinsed with water if it is dirty, but it should not be scrubbed or cleaned with soap. Ideally, the tooth should be re-implanted into the socket within 30 minutes of the injury. If this is not possible, the tooth should be placed in a container of milk or saline solution and brought to the dentist as soon as possible [27].

Another common dental emergency in trauma patients is a broken tooth. This can occur when a patient sustains a blow to the mouth or face, causing a fracture in the tooth. In cases where a tooth is broken, patients should rinse their mouth with warm water to clean the area and apply a cold compress to reduce swelling. If the tooth is sharp or jagged, patients should avoid biting down on it to prevent further damage to the surrounding tissues. Treatment for a broken tooth will depend on the severity of the fracture, but options may include bonding, crowns, or root canal therapy [28].

In addition to knocked-out and broken teeth, trauma patients may also experience other dental emergencies such as toothaches, abscesses, and soft tissue injuries. Toothaches can be caused by a variety of factors, including decay, infection, or trauma to the tooth. Patients should rinse their mouth with warm water and floss around the affected tooth to remove any trapped debris. Over-the-counter pain medication can be taken to alleviate discomfort, but patients should seek dental care if the pain persists or worsens. Abscesses are pockets of pus that form around the root of a tooth, usually as a result of infection. Patients with an abscess may experience severe pain, swelling, and fever. Treatment for an abscess may involve draining the pus, prescribing antibiotics, and performing a root canal to remove the infected tissue [29].

Soft tissue injuries, such as cuts, lacerations, and bruises to the gums, lips, or tongue, are also common in trauma patients. These injuries can be painful and may require sutures to promote healing. Patients should apply pressure to the affected area with a clean cloth to control bleeding and seek medical attention if the injury is severe or if there is excessive bleeding. In some cases, soft tissue injuries may be accompanied by fractures to the jaw or facial bones, which may require surgical intervention to repair [18].

Dental emergencies are a common occurrence in trauma patients and can range from minor injuries to more severe conditions that require immediate attention. It is important for trauma patients to be aware of the signs and symptoms of dental emergencies and to seek prompt treatment to prevent further complications. By understanding

how to manage common dental emergencies, trauma patients can receive the care they need to preserve their oral health and overall well-being [19].

Multidisciplinary Collaboration for Comprehensive Care:

Multidisciplinary collaboration for comprehensive care is a crucial aspect of healthcare that involves professionals from various disciplines working together to ensure the holistic well-being of patients. This approach recognizes that healthcare is complex and that no single discipline can address all the needs of a patient. By bringing together experts from different fields, multidisciplinary collaboration can lead to more effective and efficient care that takes into account the physical, emotional, and social aspects of a patient's health [20].

One of the key benefits of multidisciplinary collaboration is the ability to provide comprehensive care that addresses all aspects of a patient's health. For example, a patient with a chronic illness may require the expertise of a physician, nurse, social worker, and psychologist to manage their condition effectively. By working together, these professionals can develop a coordinated care plan that takes into account the physical, emotional, and social factors that may impact the patient's health [21].

In addition to providing comprehensive care, multidisciplinary collaboration can also lead to improved outcomes for patients. Research has shown that when professionals from different disciplines work together, patients are more likely to experience better health outcomes, reduced hospitalizations, and improved quality of life. This is because each professional brings their unique expertise to the table, allowing for a more holistic approach to care that addresses all aspects of a patient's health [22].

Furthermore, multidisciplinary collaboration can also lead to increased efficiency in healthcare delivery. By working together, professionals can streamline processes, reduce duplication of services, and ensure that patients receive the right care at the right time. This can lead to cost savings for healthcare organizations and improved access to care for patients [23].

Despite the numerous benefits of multidisciplinary collaboration, there are also challenges that must be addressed. One of the key challenges is communication between professionals from different disciplines. Each discipline has its own language, terminology, and ways of working, which can make it difficult for professionals to

communicate effectively. To overcome this challenge, healthcare organizations must invest in training programs that help professionals develop communication skills and learn how to work effectively as part of a multidisciplinary team [24]. Another challenge is the potential for conflicts to arise between professionals from different disciplines. These conflicts can stem from differences in opinions, values, or approaches to care. To address this challenge, healthcare organizations must establish clear guidelines for collaboration, promote a culture of respect and open communication, and provide mechanisms for resolving conflicts when they arise [25].

Multidisciplinary collaboration for comprehensive care is a vital aspect of healthcare that can lead to improved outcomes for patients, increased efficiency in healthcare delivery, and a more holistic approach to care. By bringing together professionals from different disciplines, healthcare organizations can ensure that patients receive the care they need to achieve optimal health and well-being. While there are challenges to overcome, the benefits of multidisciplinary collaboration far outweigh the drawbacks, making it an essential component of modern healthcare delivery [26].

Communication and Coordination Among Healthcare Providers:

Communication and coordination among healthcare providers are crucial aspects of delivering high-quality patient care. In a complex healthcare system where patients often see multiple providers across different specialties and settings, effective communication and coordination are essential to ensure that all providers are working together towards the common goal of improving patient outcomes [27].

One of the key challenges in healthcare communication and coordination is the fragmentation of care. Patients may see different providers for different aspects of their care, such as primary care physicians, specialists, nurses, therapists, and other healthcare professionals. Each of these providers may have their own electronic health record systems, communication protocols, and care plans, which can lead to gaps in information sharing and coordination [28].

To address these challenges, healthcare providers are increasingly turning to technology to improve communication and coordination. Electronic health record systems, secure messaging platforms, and telehealth technologies can help providers share information in real-time, coordinate care plans, and communicate with patients and other providers across different settings [29].

Another important aspect of communication and coordination among healthcare providers is the role of care coordination teams. These teams, which may include care coordinators, nurses, social workers, and other healthcare professionals, work together to ensure that patients receive seamless care across different settings and providers. Care coordination teams can help patients navigate the healthcare system, coordinate appointments, follow-up on test results, and ensure that care plans are being followed [30].

In addition to technology and care coordination teams, effective communication skills are also essential for healthcare providers to collaborate effectively. Providers must be able to communicate clearly, listen actively, and work together to make decisions that are in the best interest of the patient. This includes sharing important information, asking questions, and seeking input from other team members to ensure that all perspectives are considered [31].

Furthermore, communication and coordination among healthcare providers are not only important for improving patient outcomes but also for reducing healthcare costs. When providers are able to communicate effectively and coordinate care plans, they can prevent unnecessary duplicate tests, medications, and procedures, which can lead to cost savings for patients and healthcare systems [32].

Communication and coordination among healthcare providers are essential for delivering high-quality patient care in a complex healthcare system. By leveraging technology, care coordination teams, and effective communication skills, providers can work together to ensure that patients receive seamless care across different settings and providers. This not only improves patient outcomes but also reduces healthcare costs and enhances the overall quality of care [33].

Conclusion:

In conclusion, dental emergencies, radiology, and respiratory therapy are three key areas that play a crucial role in the care of trauma patients. By working together in a collaborative manner, healthcare providers can ensure that patients receive the best possible care and outcomes. This comprehensive approach to care not only benefits patients but also enhances the overall quality of healthcare delivery. It is essential for healthcare professionals to recognize the importance of collaboration among different specialties in order to provide the highest level of care for trauma patients.

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