Perineal abscess in pediatrics

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ABSTRACT

Perineal abscess is a clinical condition that involves the formation of purulent collections in the perineal region, presenting significant debilitating potential due to its high vascularization, which favors the spread of infection and can progress to serious complications such as sepsis and Fournier's syndrome. This article reviews the complexity of the management of perineal abscess in children, highlighting its multifactorial etiology and the need for an individualized approach in diagnosis and treatment, also exposing a case report of perineal abscess in a pediatric patient. The current literature indicates that the appropriate choice of antibiotics, such as ceftriaxone, metronidazole, amoxicillin/clavulanate, and trimethoprim/sulfamethoxazole, is crucial for infection control and prevention of complications, including recurrences and spread of infection. In addition to antibiotic therapy, early surgical drainage is often required for effective management. This study was conducted with a case report on the topic in question, followed up in a pediatric service of a teaching hospital,

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and through a literature review. To this end, recent scientific articles and theses were used, highlighting the importance of new research to broaden the understanding of the subject and improve clinical results in future cases.

Keywords: Perineal abscess, Perineal infection in pediatrics, Pediatric perineal abscess, Perineal injury.

INTRODUCTION

Perineal abscess is a clinical condition that is characterized by the formation of purulent collections in the perineal region and has great debilitating potential for affected patients. This is because this region is very vascularized, favoring the spread of the infection, which can progress to sepsis and/or in a more localized way, to Fournier's Syndrome, affecting anatomical structures in the region, which, once injured, can have alteration or loss of functionality or even tissue loss due to the necrosis and healing processes involved.

Although medicine has evolved a lot in recent years, this clinical condition presents itself as a challenge, which requires not only the treatment of the pathogen (emphasizing the fact that it is a site of easy contamination and recontamination), but also a more comprehensive look at each case, since it can be the result of multiple and different predisposing factors, including inflammatory bowel diseases (IBD), glandular obstruction, local trauma, among others.

Based on the multifactorial etiology of perineal abscesses in children, their resolution and control are challenging, such as when there are associated IBDs or, depending on the affected site, due to local colonization, in addition to the extent of the perineal abscess; factors that directly influence the choice of initial treatment and the clinical evolution of the patient. Therefore, it is a complex approach that is extremely important for the survival and quality of life of these children. To this end, it is essential to have an individualized approach to diagnosis and treatment, which, in turn, may include surgical drainage, always associated with appropriate antibiotic therapy, with a view to controlling the infection and preventing recurrences (Geltzeiler; Wieghard; Tsikitis, 2014).

As discussed, proper understanding of its pathophysiology and effective clinical management are crucial to minimize complications, ensuring patient improvement. Thus, this article aims to gather and present the main topics on the subject in question, through a literature review, providing a critical analysis of the available evidence to be able to provide a comprehensive guide for health professionals in the effective clinical management of this challenging condition, evidencing the importance of the present work.

MEDOLOGY

The present study was carried out through a literature review, using as a basis, scientific materials of different formats, such as articles published in scientific journals, course completion papers, master's degrees, book chapters on the subject in question, among others, being accessed digitally, in addition to the presentation of a real clinical case followed in a teaching hospital, during an extracurricular internship in pediatrics.

To access the bibliographic reference content, the search was carried out for the keywords "perineal abscess", "perineal infection in pediatrics" and "pediatric perineal abscess", using the help

of the Google Scholar platform, directing to the database of the main Brazilian universities as well as other teaching and research institutions, in addition to other platforms of great prestige and focused on scientific content such as PubMed, SciELO, Medline, LILACS, among others.

The research for the topic in question continued throughout the preparation of the work, giving preference to more current references with publications from 2019 onwards. In addition, it also relied on the use of previous works, due to their notoriety and the scarcity of recent works in the scope of the theme in question.

CASE REPORT

JLCTM patient, male, 1 month and 26 days old, referred for hospitalization with a history of abscess in the perianal region that had started 20 days ago, shown in Figure 1, with no other associated complaints. She reported previous use of cephalexin for 10 days, but without improvement. In a hospital environment, it was decided to use amikacin and intravenous axacillin, associated with warm compresses, which had a great effect on the drainage of the abscess. After evaluation of the pediatric surgery, a perianal fistula was found and in order to avoid possible recurrences of this abscess, fistulectomy was performed, a procedure that occurred without complications. Subsequently, topical neomycin was associated with the aim of aiding healing by second intention. Postoperative care consists of family guidance regarding abundant cleaning with saline solution or running water of the site after evacuations and application of the ointment in question at the surgical site. The postoperative period is shown in Figure 2.

Figure 1: Perineal and perianal abscess of the breastfeeding patient at the time of admission.

Source: personal collection (photo authorized by the patient's guardian).

Figure 2: The abscess was located after surgery and antibiotic therapy.

Source: personal collection (photo authorized by the patient's guardian).

DISCUSSION

The perineal region is a region that is superficial to the pelvic floor muscles, medially to the thighs and contains noble anatomical structures. The male and female perineum have structures in common, such as the anus and the pudendal artery, and they differ in structures related to the genital organs, such as, for example, in men there is the penis, the levator muscles of the penis, the scrotal sac and, in females, there is the vagina and vulva, composing the organs of the urogenital system (Sobotta, 2023). Considering such structures of great importance for the patient's quality of life in their physiological and sexual functions and, when injuries occur in these areas, they can evolve unfavorably with impairment of the anatomical structures present in the region, thus interfering in addition to aesthetics, in the physiological functioning of urination and evacuation, and can cause impacts on mental development, and even compromising their ability to reproduce (Barber, 2024).

In addition, the contamination of perineal wounds in pediatric patients represents a significant challenge in clinical management, given the specific vulnerability of this age group, presenting several factors that have the potential for contamination of these wounds. Among them, the specific aspects of pediatric anatomy stand out, due to the fact that the perineal anatomy of pediatric patients presents distinct characteristics that can influence the risk of contamination. According to Franciozi *et al.* (2021), children are more prone to trauma and local infections due to the thinness of the skin and the incomplete development of immune function. This can result in a greater susceptibility to post-surgical infections or those resulting from trauma, since their immune system is still developing

According to the review by Couto and Carneirto (2017), the immune system of children is less mature compared to that of adults, which can impact the effectiveness of the inflammatory response and increase the risk of infections in perineal wounds. Such immunological immaturity, combined with the presence of wounds, may provide a greater probability of contamination, since

lesions in this region have a higher risk of contamination, due to the presence of the anus, a place that contains bacteria, due to contact with feces, in addition to the presence of the external urethral ostium, through which urine is released.

In these places, therefore, there is the deposit of substrates necessary for the proliferation of pathogens and, in addition, the perineal region of pediatric patients is more susceptible to their development due to favorable environmental conditions. This is because it consists of a hot and humid region, due to the presence of diapers, especially when kept for long periods, changed less frequently than necessary; providing the creation of a favorable environment for microbial growth (SBP, 2021). Studies highlight the importance of keeping the perineal area clean and dry, to reduce the risk of infections and promote adequate health in childhood (Aquino; Chianca; Brito, 2012).

Therefore, inadequate hygiene is an important risk factor for infections in pediatric perineal wounds. The literature suggests that the ability of parents and caregivers to maintain adequate hygiene practices may be limited, directly affecting wound health, and studies show that parental education on perineal care is essential for the prevention of infectious complications (Desalegn *et al.*, 2024).

However, in some cases, the maintenance of hygiene and the control of factors pointed out as substrates for the formation of abscesses are a real challenge for caregivers, as there is the presence of another factor, congenital anomalies that affect the anatomy and functionality of adjacent structures. Among these anomalies, the following stand out: i) malformations in the urinary tract, ii) defects in anal sphincter formation, iii) congenital fistulas, and iv) soft tissue anomalies that play significant roles in the predisposition to these infections (IHN *et al*., 2020).

These congenital anomalies (CA) are defined as functional or structural changes in fetal development that originate in the embryonic period. These conditions can be the result of genetic, environmental or unknown etiology causes. Among the main causes of anomalies are congenital and perinatal disorders, often associated with infectious agents that impair fetal organogenesis, such as rubella viruses, HIV, Zika, cytomegalovirus, as well as *Treponema pallidum* and *Toxoplasma gondii.* The use of licit and illicit substances, teratogenic medications, and maternal endocrinopathies also contribute to the development of CF (Mendes, 2018). Thus, the important role of parents in the child's health is observed, since maternal self-care in prenatal care, or the lack of it, can influence the development of the fetus. Therefore, the importance of adequate prenatal care in order to minimize the chances of CAs is ratified (PAHO, 2020).

Urinary tract malformations, in turn, lead to the presence of extravasated urine in adjacent areas, as well as anorectal anomalies to the presence of fecal content. The presence of both can create a favorable environment for the development of perineal abscesses, as already mentioned; these, in turn, when not corrected, can cause recurrent abscesses (Kołodziejczak *et al.*, 2017). Such congenital

malformations can vary in complexity from relatively simple deformities to conditions that present a high degree of difficulty to correct (Batista, 2017).

Anorectal anomalies (RAA) can be classified according to the Krickenbeck system as: i) perineal fistula, ii) urethral fistula (divided into bulbar and prostatic), iii) bladder fistula, iv) vestibular fistula, v) absence of fistula, vi) anal stenosis, and vii) cloaca. The initial diagnosis is usually made through physical examination of the newborn (NB), and may be supported by imaging tests such as radiographs, perineal ultrasound (USG), distal colostogram, and magnetic resonance imaging (MRI) (Carroll *et al*., 2016).

And according to Lowdermilk *et al*. (2012) Among the genitourinary anomalies, the most prevalent is the imperforate anus, an anomaly that is often associated with another malformation or genetic alteration. This anomaly is related to the persistence of the anal membrane, resulting in the lining of the anal canal by a thin membrane, with varied presentations, which can be complete or incomplete, with the presence of fistula or not, where the absence, atresia and stenosis of the anus are framed, being the most prevalent anorectal malformation.

Some anomalies are even rarer but important to consider. These result from an abnormal development of the urorectal septum, which is an embryological structure responsible for separating the cloaca into urogenital and anorectal portions, including cloacal exstrophy. In this syndrome, there is a malformation in the urinary and genital tract, causing there to be only a single hole for the elimination of urine, feces, and other fluids, which then drain from body fluids and increase the risk of frequent infections and other health complications (Manfroi, 2019).

In general, all newborns undergo a physical examination at birth, which can reveal and visually diagnose an anorectal malformation. However, it is essential to make an accurate diagnosis, including the complete definition of the anatomy before any intervention through complementary tests (Chan *et al*., 2014). In this sense, for the correction of these malformations, the treatment involves anatomical repair through surgery. These involve different techniques and surgical times that depend on the characteristics involved in the presentation of each case (Amorim *et al.*, 2022)element.

Thus, when performing the surgical procedure to correct anomalies, it is necessary to be even more careful with pediatric patients when using medical devices, such as catheters and drains, which can represent another risk for infection. The presence of urinary catheters and other devices, in addition to favoring communication between the external and internal environments, also favors the occurrence of friction and pressure with the skin, leading to the occurrence of dermatitis or other new lesions in the region (Brandão *et al*., 2018).

In addition to these, superficial cutaneous bacterial infections are other causes common to pediatric patients that can also progress to abscesses, as is the case of ecthyma, which is a bacterial

infection that affects the dermis and is characterized by ulcers covered by yellowish crusts, with raised borders and violet color, where the predominant etiological agent is *Streptococcus pyogenes*, while *Staphylococcus aureus* acts as a secondary agent with a synergistic effect on the perpetuation of the infection. There is a variant of this condition, called ecthyma gangrenosum, caused by *Pseudomonas aeruginosa*, which can affect individuals of any age group. This condition begins as a non-bullous impetigo, with a slower progression, with ulceration that gradually extends to the dermis, developing into a dark, dry, adherent, and eschar-like crust with raised edges (SBP, 2022). Although the lesions are usually few, they can be multiple and found at different stages of evolution, commonly affecting the areas of the perineum, buttocks, and distal extremities; they can also appear anywhere on the body and due to this presentation can evolve into perineal abscess (Torres *et al*., 2016).

Another pathology related to superficial cutaneous bacterial infection, very frequent in pediatric patients and which can progress to perineal abscess, is bullous impetigo, caused almost exclusively by exotoxin-producing *Staphylococcus aureus*. This condition represents a localized form of staphylococcal scalded skin syndrome and is more common in children under two years of age, who account for 90% of all cases (Nardi; Schaefer, 2023). The disease is manifested by superficial, thin-walled, flaccid blisters containing clear fluid that tend to rupture easily within 1 to 3 days, resulting in a bordered area around a moist, erythematous base, progressing to a brown lesion or with an appearance similar to scalded skin and, when scabs are removed, there is wet-based and hypermemic exposure. In infants, the lesions usually occur mainly in the limbs, while in newborns, the most affected areas are the perineum, the periumbilical region, the armpits, and the neck. These lesions tend to coalesce, forming extensive eroded areas (SBP, 2022).

Among the other causes of perineal injury, perineal trauma stands out, often resulting from falls or accidents during recreational activities, and is a common cause of injuries in this region in children, as they can form a solution of continuity allowing colonization of microorganisms (Filho *et al*., 2019). From an epidemiological point of view, studies indicate that falls are responsible for a substantial proportion of perineal injuries in children, with rates varying according to the environment and age group of the patients studied (Gill, Kelly, 2024).

In addition, bacterial infections of the anal glands represent another significant cause of perineal injuries. These infections can lead to the formation of perianal abscesses, especially in children with perianal abscess obstruction or predisposition to skin infections (Gong *et al*., 2018).

In addition to the causes already mentioned, when identifying the development of perineal abscess in older children, it is important to evaluate it in general, since this lesion can be the first sign of something systemic, such as IBDs, whether it is Crohn's disease (CD), ulcerative colitis (UC) or even immunodeficiencies, such as leukemia or AIDS (Carmona, 2023).

Although Crohn's disease occurs mainly in young adults, there are reports of manifestation in pediatric patients with the formation of perineal abscesses, as demonstrated in the study by Silveira *et al*. (2008), where the case of a newborn patient who presented such a manifestation on the third day of life is reported. It is also confirmed that IBDs that have a very early onset in childhood (under 6 years of age) are rare, very aggressive, difficult to control and have a poor prognosis, making it essential to have a correct diagnosis and appropriate treatment to prevent complications (Penatti, 2020).

Based on the above, it is important to observe the importance of managing comorbidities and the general condition of pediatric patients, in addition to caring for lesions. This is because conditions such as diabetes, IBDs, and immunosuppression are widely correlated with the incidence of perianal abscesses in the pediatric population; although inflammatory bowel diseases are less common conditions compared to adults (Adegbola *et al.*, 2018). Especially diabetes, when adequate glycemic control is not achieved, there is greater vulnerability to infections, affecting wound healing , and superficial infections can evolve more severely in these patients (Calliari; Almeida; Noronha, 2020).

The clinical presentation of perineal abscess, in many cases, as presented in the case report, begins with intense pain at or near the anal border, with a nodulation in the region, which becomes swollen and erythematous, and may be accompanied by general malaise and fever. Once the perineal abscess has formed, there may be local or systemic complications.

Local complications involve the nearby anatomical structures, leading to significant morbidity. The involvement of adjacent tissues, such as the ischiorectal fossa or the perianal region, can result in the formation of complex fistulas (Buchanan et al., 2004). That according to Afşarlar *et al.* (2011), the recurrence of anorectal fistulas after perineal abscesses can reach 30%, highlighting the importance of post-treatment clinical surveillance. These fistulas may require surgical intervention for resolution and are associated with prolonged healing times and a higher risk of recurrence (Jimenez, Mandava, 2023).

Treatment is predominantly done in the child's hospitalization, most of the time it is necessary to have a surgical approach with drainage of the abscess contents, correction of anatomical anomalies if present, associated with antibiotic therapy, analgesia, and control of gastrointestinal transit for postoperative recovery, when necessary (Sigmon, Emmanuel; Tuma, 2023).

In addition, untreated or inadequately drained abscesses can lead to the formation of chronic abscesses or even necrotizing fasciitis, an infection that can cause cutaneous and subcutaneous vascular thrombosis, resulting in skin necrosis in the affected region, as well as Fournier's Syndrome, a potentially fatal clinical condition characterized by rapid and intense tissue destruction of soft tissues, involving the subcutaneous tissue and fascia, of rapid progression, reaching the genital

region and nearby structures with a high possibility of systemic involvement (Leporaes *et al.,* 2015; Cardoso, Féres, 2007).

Considering systemic complications, the main one is the occurrence of bacteremia and sepsis, requiring urgent medical intervention, including broad-spectrum antibiotic therapy and intensive care management due to potential morbidity and mortality (Van Koperen *et al*., 2008)

In order to treat perineal abscess so that it can resolve without complications, whether systemic or local, it is necessary to evaluate the condition of each patient individually, identifying the factors and pathogens involved, and using transanal ultrasound and transcutaneous ultrasonography to identify, specify the extent of the abscess and assist in determining the surgical technique to be performed (Maconi, Greco, Asthana, 2017).

In addition to specifying the extent of the abscess to verify the surgical approach strategy for drainage that is most often necessary, it is necessary to properly define antibiotics to achieve complete cure and prevent complications, such as recurrences and spread of infection (Singh *et al*., 2021).

As pointed out, the occurrence of the lesion addressed in the present study involves different factors that often occur together, but depend on the colonization and action of microorganisms to trigger their formation and evolution. And these microorganisms, more specifically bacteria, are differentiated according to their structural and functional characteristics (aerobic, anaerobic, or facultative (Varela, 2018).

Structurally, most bacteria are differentiated mainly by the structure of the cell wall, a structure responsible for the shape, rigidity, cell division and osmotic maintenance of the bacteria, presenting a macromolecular complex, known as mucocomplex (also called peptidoglycan or glycopeptide), which is of great importance for the classification of bacteria by the Gram staining method. In the so-called gram-negative bacteria, this complex represents a smaller fraction of the total wall in relation to the gram-positive ones. The cell wall of gram-negative women is chemically more complex, with a higher amount of amino acids and lipids. Its external lipopolysaccharide (LPS) fraction determines its toxigenicity and antigenicity. However, there is a group of bacteria called mycoplasmas, which do not have a cell wall or peptidoglycan, although molecular studies classify them close to gram negative, they are unable to be stained by the classical Gram method, since they do not have a wall, as exemplified in tables 1 and 2 (Nogueira, Miguel, 2013).

Table 1: Examples of aerobic bacteria, grouped according to Gram staining and morphology.

Classificação das bactérias pelo coloração de Gram (em negrito estão as mais encontradas)

Bactérias Aeróbias					
Gram Positivos		Gram Negativos			
Cocos	**Bacilos**	**Cocos**	**Bacilos**		**Coco-bacilos**
Aerococcus	***Actinomyces spp***	***Moraxella catarrhalis***	**Enterobactérias**	**Fermentadores**	*Actinobacillus spp*
Alloiococcus	***Arcanobacterium***	***Neisseria spp.***	*Buvdica aquatica*	*Aeromonas spp*	*Afipia spp*
Dolosigranulum	*Aureobacterium*		*Cedecea spp*	*Chromobacterium*	*Arcobacter spp*
Enterococcus spp	***Bacillus spp***		***Citrobacter spp***	*Plesiomonas*	***Bartonella spp***
Gemella	*Corynebacterium*		*Edwardsiella spp*	***Pasteurella spp***	***Brucella app***
Globicatella	*Dermabacter*		***Enterobacter spp***	***Vibrio spp***	***Bordetella spp***
Helcococcus	*Erysipelothrix*		***Escherichia coli***	**NÃO fermentadores**	*Calymmato bacterium*
Lactococcus	***Gardnerella***		*Escherichia spp*	***Acinetobacter spp***	***Campylobacter spp***
Leuconostoc	*Gordona*		*Ewingella*	*Agrobacterium*	*Capnocyto-phaga spp*
Micrococcus spp	*Kurthia*		*Hafnia alvei*	*Alcaligenes sp*	*Cardio-bacterium*
Pediococcus	*Lactobacillus*		***Klebsiella spp***	*Bergeyella*	***Chlamydia spp***
Staphylococcus spp	***Listeria spp***		*Kluyvera spp*	*Brevundimonas spp*	***Coxiella bunetii***
Stomatococcus	*Microbacterium*		*Leclercia*	***Burkholderia spp***	*Eikenella corrodens*
Streptococcus spp	***Mycobacterium spp***		*Leminorella spp*	*Chryseobacterium spp*	*Ehrlichia spp*
Tetragenococcus	***Nocardia spp***		*Moellerella*	*Chryseomonas luteola*	*Francisella spp*
Vagococcus	*Oerskovia*		***Morganella spp***	*Comamonas spp*	***Haemophilus spp***
	Rhodococcus		*Pantoea*	*Empedobacter brevis*	***Helicobacter spp***
	Rothia		***Proteus spp***	*Flavimonas*	*Kingella spp*
	Tsukamurella		***Providencia***	***Flavobacterium spp***	***Legionella spp***
	Turicella		*Rahnella aquatilis*	*Methylobacterium*	*Psychrobacter*
			Salmonella spp	*Moraxella spp*	***Rickettsia spp***
			Serratia app	*Ochrobactrum*	*Streptobacillus*
			Shigella spp	*Oligella spp*	*Suttonella*
			Tatumella ptyseos	***Pseudomonas spp***	
			Trabulsiella	*Roseomonas spp*	
			Yersinia spp	*Shewanella spp*	
			Yokenella	*Sphingobacterium spp*	
				Stenotrophomonas	
				Weeksella virosa	

Source: Taken from "Rational use of antimicrobials", by Mota *et al*., 2010, Revista Medicina (Ribeirão Preto), volume 43, n. 2, 167-168.

Table 2*: Examples of anaerobic bacteria, grouped according to Gram staining and morphology.*

Classificação das bactérias pela coloração de Gram (em negrito estão as mais encontradas)	
Bactérias Anaeróbias	
Gram Positivos	**Gram Negativos**
Cocos	Cocos
Gemella	*Acidaminococcus*
Peptococcus	*Megasphaera*
Peptostreptococcus	*Veillonella*
Reuminococcus spp	
Staphylococcus	
Streptococcus spp	
Bacilos	Bacilos
Actinomyces spp	*Anaerobiospirillum*
Atopobium spp	*Anaerorhabdis*
Bifidobacterium spp	***Bacterioides spp***
Clostridium spp	*Bilophila*
Eubacterium spp	***Campylobacter spp***
Filifactor	*Catonella*
Lactobacillus spp	*Centipeda*
Mobiluncus spp	*Desulfomonas*
Propionibacterium spp	*Desulfovibrio*
	Dialister
	Dichelobacter
	Fusobacterium spp
	Hallela
	Johnsonella
	Leptotrichia
	Mitsuokella
	Porphyromonas spp
	Prevotella spp
	Selenomonas spp
	Tissierela

Source: Taken from "Rational use of antimicrobials", by Mota *et al*., 2010, Revista Medicina (Ribeirão Preto), volume 43, n. 2, 167-168.

Some of these bacteria, thanks to their structural characteristics, have greater resistance compared to others. In addition, over the years, they have undergone adaptations and mutations, providing increased virulence, resistance to the environment and resistance to the most used antimicrobials, thus impairing the therapeutic process and making them have a greater potential to establish themselves and cause more serious infections (Cunha, 1998).

This resistance to antimicrobial drugs is a genetic phenomenon associated with the presence of specific genes that encode several biochemical mechanisms capable of neutralizing the action of drugs. This resistance may arise due to mutations that occur in the microorganism during the

reproduction process, resulting from errors in the replication of the base sequence of chromosomal DNA, which encodes genetic information. Another form of resistance is the acquisition of genes responsible for this trait, a process known as transferable resistance (Tavares, 2000).

The pathogens present in perineal abscesses have a great relationship with the gastrointestinal tract, due to the presence of the anus, as well as the presence of the fecal content itself, and microorganisms are frequently found in the gastrointestinal flora, including facultative and obligate anaerobic bacteria, gram-negative aerobic bacteria and gram-positive aerobic bacteria. And with regard to hospital infections, there is a predominance of a more resistant flora, which include *Pseudomonas aeruginosa*, *Enterobacter* sp., *Proteus* sp., methicillin-resistant *Staphylococcus aureus*, enterococci and *Candida* sp. (Coelho, Baretta, Okawa, 2007).

Looking at the pathogens involved in these types of infections, studies highlight *Staphylococcus aureus* as one of the main pathogens involved (as seen in the aforementioned skin infections), along with *group A* Streptococcus and *Escherichia coli*, reflecting a predominance of gram-positive and gram-negative bacterial infections in this age group (Yang *et al*., 2024).

When it comes to the microbiology of perineal abscesses, more specifically in children, there is often the presence of anaerobic bacteria such as *Bacteroides* spp. and *Prevotella* spp., as well as *Peptostreptococcus* spp., which are commonly found in the intestinal microbiome. In specific clinical settings, *Enterococcus* spp., Pseudomonas aeruginosa, and *methicillin-resistant Staphylococcus aureus* (MRSA) may also be present, especially in hospital settings or in immunocompromised patients (Hong *et al*., 2024).

The most frequently recommended antibiotics for the treatment of perineal abscesses include ceftriaxone, a third-generation cephalosporin effective against a wide range of gram-positive and gram-negative bacteria; metronidazole, which is active against anaerobic bacteria common in anorectal perineal abscesses; the amoxicillin/clavulanate combination, which provides coverage against gram-positive, gram-negative, and anaerobic bacteria, and is useful in polymicrobial infections; and trimethoprim/sulfamethoxazole, effective primarily against gram-negative bacteria such as *Escherichia coli,* often associated with urinary tract infections complicated by perineal abscesses (Lichtenstein, O'brien, 2018; Thabit *et al.*, 2016; Tamma, Cosgrove, Maragakis, 2012).

However, the beginning of antibiotic therapy is empirical. The choice of antibiotic should take into account factors such as the local susceptibility of the bacteria, the severity of the infection, and the patient's clinical conditions. Cultures and sensitivities of the causative organism are rarely useful at first when community infection is suspected, and are more useful when the patient does not improve after initiation of empirical therapy or when multidrug-resistant or nosocomial bacteria are suspected. In cases of polymicrobial infections or suspected bacterial resistance, antibiotic

combination or therapeutic adjustments based on microbiological cultures may be necessary (World Health Organization, 2023; Lee, Tan, 2018; Xu, Tan, Chong, 2016).

Once not treated in an ideal way initially, perineal abscess can evolve in an even more severe form, called Fournier's gangrene or Fournier's Syndrome, an infection that can affect deeper structures, even if the skin manifestations do not appear initially. It has high morbidity and mortality due to affecting subcutaneous tissues, pelvic muscle phacia, scrotum, perineum, and external genitalia (de Souza *et al*., 2020; Tikami *et al*., 2020).

Fournier's gangrene should be diagnosed and treated urgently due to its high potential for severity. The diagnosis is based on the patient's clinical practice, imaging and laboratory tests in a complementary way. However, these should not delay the onset of debridement, since the early approach is related to a better prognosis of treatment (Moreira, 2022).

Of the imaging tests, computed tomography (CT) is the most cost-effective test, being useful in identifying the site of origin of the infection, as well as determining the extent, inflammation and emphysema when present. Radiography can be useful to identify edema and subcutaneous emphysema, whereas magnetic resonance imaging (MRI) is rarely used, given its high cost and more restricted access, and CT and radiography are more cost-effective. Ultrasonography is a great option for early stage evaluation of the condition, due to its high effectiveness, low cost, and does not use radiation, with the disadvantage of being operator-dependent (Inácio *et al*., 2020; Fonseca *et al*., 2018).

Laboratory tests are nonspecific for the diagnosis of Fournier Syndrome. The presence of leukocytosis, anemia, electrolyte disturbances, elevated serum creatinine, thrombocytopenia, and hypoalbuminemia is routinely observed (de Souza *et al*., 2020).

The treatment of Fournier's gangrene (FG) consists of vigorous hydration of the patient, restoration of fluid and electrolyte balance, drainage of collections, debridement, broad-aspect antibiotic therapy, and the use of skin grafts may be added to the closure of wounds for more extensive lesions (Lohsiriwat, 2016).

The main treatment measure for GF is debridement, and the use of broad-spectrum antibiotics with coverage for gram-positive, gram-negative, and anaerobic drugs should be employed. In cases where the hypothesis of community infection is raised, according to the literature, the choice is often made of the concomitant use of clindamycin, gentamicin and ampicillin associated with sulbactam or a third-generation cephalosporin administered intravenously. Chloramphenicol is shown to be an alternative when clindamycin is not effective. In cases where the causative agents are fungi or other hospital pathogens, the application of fluconazole, vancomycin or piperacillin associated with tazobactam is considered as treatment. And in 2014 the use of a carbapenem was added as an option

of choice for monotherapy by the Infections Diseases Society of America (IDSA) (Hagedorn; Wessells, 2017).

However, the use of antibiotics in pediatric patients can significantly influence the incidence of perineal infections, since the human body has its own colony of diverse microbiota in places such as the gastrointestinal tract, skin and genitalia that in normal situations is in balance, but with the inappropriate or excessive use of antibiotics can lead to imbalances of this normal microbiota, potentially promoting the proliferation of pathogenic microorganisms, such as fungi and resistant bacteria, which often cause perineal infections. In addition, the elimination of protective bacterial flora due to the use of antibiotics inappropriately can reduce the body's natural resistance to pathogens, increasing susceptibility to new infections, morbidity of patients, prolonging the length of hospital stay, and generating a new infection. extra costs for health services, which could be avoided with the rational use of antimicrobials. Therefore, the prescription and use of antibiotics should be carefully managed to minimize the risk of complications and secondary infections in the perineal region in children (Mota *et al.*, 2010).

FINAL CONSIDERATIONS

Finding specific general and epidemiological data on perineal abscesses in pediatric patients due to the specificity of the theme proved to be a challenge for the elaboration of the work and evidenced the need for a greater approach to the theme correlating with the age group in focus, also leading to the use of literature that has been published for a longer time.

Furthermore, as pointed out, although perineal abscess is a complication of infectious processes that could often be treated with antibiotic therapy even at home, in case of early treatment, it can still evolve into severe complications and great risk for the patient, which can course with the injury or even the loss of important organs as in the case of the male genitals in the case of the sequelae of Furnier's Syndrome that translates into aggravations in their psychosocial development and in the future in the impairment of sexual practice and consequently may even make it impossible to reproduce, causing not only physical but also psychological damage.

However, the importance of the rational choice of antibiotics, based on local evidence and guidelines, is extremely valuable, as a fundamental measure, associated with a surgical approach to drain the content, in order to achieve therapeutic success and improve clinical results, avoiding losses. As presented, antibiotic therapy is an important tool in the fight against infection by microorganisms, however, if done wrongly, it can cause future damage, such as due to the imbalance of the patient's physiological flora, as well as the inappropriate management of the case can allow the evolution of the condition in a severe way.

Considering that the high risk of contamination of perineal wounds in pediatric patients is intrinsically linked to anatomical, immunological and environmental factors specific to this age group, in combination with an immature immune response, the need for intensive care and the proper management of wounds and medical devices are fundamental for the prevention and treatment of infections. It has been shown that continuous studies and improvements in care practices are essential to reduce the incidence of infectious complications in children.

Thus, the importance of conducting more research on the subject is evidenced, and it is of great value and as a suggestion to carry out a quantitative research with data on different clinical cases and with a large sample. Likewise, the importance of greater dissemination and awareness in the academic and professional environment of professionals working in the health area is latent.

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