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Surgery on Children

Original Article

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# Role of percutane peritoneal drainage in management of neonatal pneumoperitoneum: is surgery always necessary?

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## ABSTRACT

**Aims:** The standard procedure in the management of neonatal pneumoperitoneum (NP) cases is laparotomy. However, in some of the cases in which surgery is not a viable option, percutaneous peritoneal drainage (PD) can be performed in order to stabilize the patient prior laparotomy. This study reviews the role of PD in NP patients using previous studies in the literature.

**Methods:** 26 neonates diagnosed with NP in Van Yüzüncü Yıl Faculty of Medicine, Van Training and Research Hospital neonatal ICU from April 2015 to January 2018 were retrospectively reviewed. In terms of surgical assessment, patients were divided into 2 groups according to their birth weight. Group A consisted of neonates with birth weight above 1000 grams whereas Group B consisted of neonates with birth weight above 1000 grams whereas Group B consisted of neonates with a birth weight of 1000 grams or below. Demographic values, diagnosis, and treatment methods were put on record in patient files.

**Results:** 10 cases (7 male – 3 female) in Group A had a mean body weight of 1850 (Range: 1070 – 3400 gr) grams. In this patient group, NP developed as a result of pneumothorax, necrotizing enterocolitis (NEC) and spontaneous intestinal perforation (SIP). 3 (30%) of the patients who were treated with classical approaches were lost during the treatment period. Group B consisted of 16 (9 male – 7 female) patients with a mean body weight of 780 (Range 470 – 950) grams. In this case group, NP developed as a result of NEC. PD was performed prior to conventional treatment procedures and 5 (31%) of the patients were lost during the treatment period.

**Conclusion:** Group B had similar mortality rates with Group A. result explains to us that PD is a viable option in stabilizing the patient prior to laparotomy as a starting procedure, especially in neonates below 1000 grams and deemed as surgically unstable.

**Keywords:** Neonatal pneumoperitoneum, peritoneal drainage, newborn, necrotizing enterocolitis

## INTRODUCTION

Trapped air collected below the diaphragm in upright-position X-rays indicate pneumoperitoneum.[1] Regardless of the reason, neonatal pneumoperitoneum (NP) leads to abdominal distension, nutritional intolerance, respiratory distress, shock and eventually death. Etiology is hard to discern using clinical assessment and radiological studies. NP is usually related to intestinal perforation but is rarely caused without and it does not always indicate surgical intervention.[2] Neonatal intestinal perforation can develop secondary to necrotizing enterocolitis (NEC), spontaneous intestinal perforation (SIP), meconium-related ileus, gastric perforation and atresia. Bowel resection with or without ostomy (BR/O), patch drainage and wait (PD&W), peritoneal drainage (PD) insertion and combined methods can all be used for treatment. Choosing a surgical technique for each patient is a challenge due to high rates of surgical morbidity and mortality in those cases.

In this study, we would like to review the approach to neonatal pneumoperitoneum and role of peritoneal drainage in the context of the literature.

## METHODS

26 neonates diagnosed with NP in Van Yüzüncü Yıl Faculty of Medicine, Van Training and Research Hospital neonatal ICU from April 2015 to January 2018 were retrospectively reviewed. The study was carried out with the permission of Ethical Committe of Faculty of Van Yüzüncü Yıl (Date:04.01.2018, Decision No: 2018101). All procedures were carried out in accordance with the ethical rules and

the principles of the Declaration of Helsinki. Patients' body weight, sex, diagnosis, gestational age and treatment choices were all put on record. Cases were divided into two groups according to their birth weight. Patients with birth weight above 1000 grams were included in group A whereas patients with birth weight equal or below 1000 grams were put into group B.

BRO routinely performed in NEC, SIP and other intestinal perforations. BRO includes opening of ostomy with healthy bowel tissue after resection of necrotizing segments. We used BRO approach in the all cases above 1000 grams and under 1000 grams after performing of PD. The PD & W method was preferred especially in cases where BRO could develop short bowel syndrome. In this method, all perforation areas were sutured without taking into account the necrosis areas and left to heal spontaneously with peritoneal drains. PD technique includes the insertion of pen rose drain to peritoneal cavity from right lower quadrant of abdomen under local anesthesia for removing of the air and infected peritoneal content from abdomen. PD was used in patients who are accepted unstable for surgery under 1000 grams.

The results were statistically assessed by using SPSS version 24. Normality controls were done using Shapiro-Wilk Test. Groups were compared in terms of mortality using independent sample t-test. Statistical significance level was set as $p<0.05$. Ethical acceptance was taken from the local ethic committee.

## RESULTS

The study includes 26 (16 males–10 females) neonates with NP. Group A consisted of 10 patients with 7 males and 3 females. Their mean body weight was measured as 1850 (Range 1070 – 3400) grams. Group B had 16 patients with 9 males and 7 females. Mean body weight of this group was calculated as 780 (Range 470–950) grams. Different degrees of pneumoperitoneum Figure 1 were detected in all patients. 8 patients were operated for NEC Figure 2 and 1 patient was operated for SIP Figure 3.

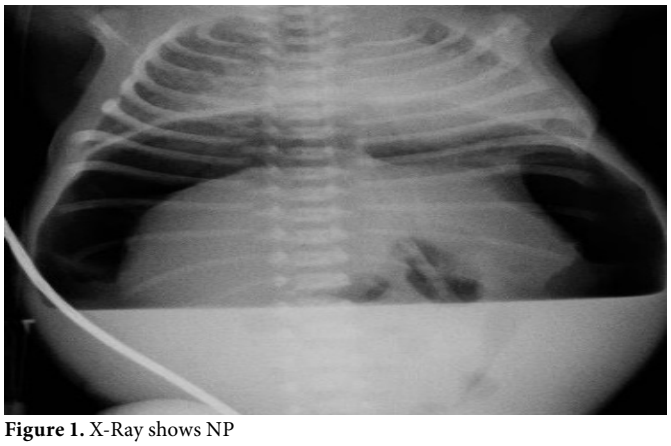

**Figure 1.** X-Ray shows NP

Intestinal resection – anastomosis was done in SIP case whereas BR/O was performed in NEC patients. 3 (30%) patients were lost due to NEC. Group B consisted completely of NEC cases. Due to high mortality risk associated with surgery, PD was performed in all patients as the initial treatment procedure Figure 4.

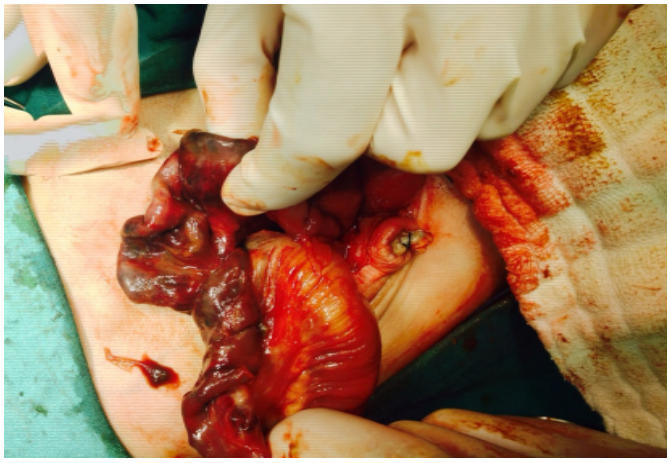

**Figure 2.** Intraoperative image of NEC

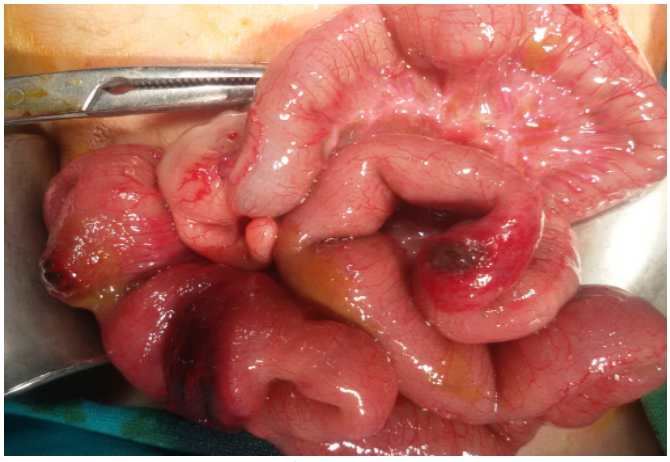

**Figure 3**. Intraoperative image of SIP

**Figure 4**. PD Inserted in right lower quadrant

In 7 patients with optimum hemodynamic conditions, 5 patients received BR/O surgery following a 12-hour observation period. 2 patients were operated using PD&W due to a risk of short intestine syndrome development. 2 out of 5 BR/O and 1 PD&W patient were lost due to long-term complications. 2 cases who received initial PD intervention were lost before secondary surgery due to instability. 7 patients showed a recession in pathology following PD so no additional surgical intervention was indicated. 5 (31.2%) patients in this group were lost. All finding data were outlined

on Table 1. In group B; patients with and without PD were compared for mortality. There was no significant statistical difference (p > 0,05). But patients who underwent PD had a higher risk of surgery than the other patients.

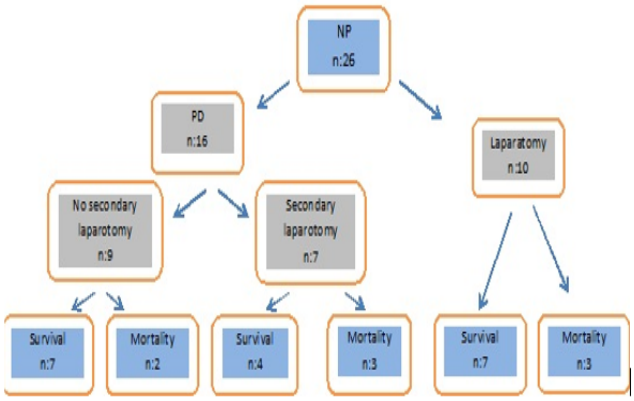


**Table 1.** Survival and mortality within 6 months after primaryintervention in infants

## DISCUSSION

Pathology might not be clear in neonates operated for pneumoperitoneum. However, the most common reasons for pneumoperitoneum which does not require surgical intervention are mechanical ventilation and tension pneumothorax.[1] Gas transfer can happen between the chest and abdominal cavity due to periesophageal groove, congenital defects and pleuroperitoneal fistula.[1-3] Therefore, a conservative approach using chest tube is an effective solution in NP cases with pneumothorax without abdominal findings. Gastric perforation can rarely develop in the first week of life due to congenital or acquired reasons. Showing symptoms within the first week of life and absence of gastric air in upright x-rays might indicate gastric perforation. Emergency laparotomy in chosen patients or post-PD laparotomy in unstable premature newborns can be used for treatment. One of the most common reasons for pneumoperitoneum without perforation is pneumatosis cistoides intestinalis (PCI). PCI frequently accompanies NEC in preterm babies. It is often treated with conservative and medical methods.[1]

NEC is a quite severe inflammatory condition seen in premature babies with an incidence rate of 1-5% in neonatal ICUs. It is one of the leading mortality causes with 10-50%.[4,5] SIP is a rare condition which is seen in neonates with very low birth weight as intestinal perforations without necrotic changes. It is considered as a different clinical entity other than NEC.[6] It has a multifactorial etiology and can be related to congenital muscle anomalies, air embolism, indomethacin usage and high-dose steroid usage due to pulmonary dysplasia. SIP is frequent in premature babies and babies with low birth weight.[7] Although medical treatment is the most common management technique, about 30% of cases require bowel resection (with or without diverting enterectomy (BR/O)) and PD.[2-7]

BR/O has a complication rate around 68% which might manifest itself as local infection, sepsis, stricture, short bowel syndrome, incisional hernia, complications of long-term total parenteral nutrition, repeating surgeries and extended hospitalization periods.[4,8] Due to those complications, some of the authors suggest PD&W in those cases. This method is based on waiting for spontaneous healing with good angiogenesis.[8] Diesen reported a case that he treats an NEC with medical treatment, he saw old perforated bowel segment was spontaneously covered with momentum during another unrelated surgery.[9] Other than that, NP can develop in mechanical obstructions such as anal, intestinal and colonic atresia and Hirschsprung 's Disease as well.

Using PD in newborn NEC perforations was first suggested by Ein in 1977.[10] It was also reported that it can be used for resuscitation during a transition to laparotomy.[11] Some authors even argue that PD can be definitively used without laparotomy.[11,12] Moss's meta-analysis study which included 10 cases reported similar results with PD and laparotomy.[12] In our study, we also did not detect a significant difference in mortality rates when groups with and without PD were compared. However, it does show a positive effect on low birth-weight neonates (LBWN) survival rate. 43.7% of our LBWN cases did not require additional surgery. Birth weight is the most important independent factor in NEC-related PD.[4,12] PD prevents respiratory and circulatory complications caused by tension pneumoperitoneum[13] and makes time for the patient to obtain optimal vitals prior to appropriate surgical intervention.

Some authors reported that PD can be used in intestinal perforations seen in low birth-weight neonates as a primary intervention method and it shows about a 40% success rate in definitive treatment when used as the single metho.[13] Secondary surgery might be indicated in both NEC and SIP cases.[13] Although BR/O is the most commonly used technique for secondary surgery, PD can also be used to alleviate compression findings associated with the abdominal compartment. PD; thus making the demarcation line more prominent so that PD & W preference rates can be increased in selected cases with a risk of short bowel syndrome. All of our approaches were outlined on Table 2.

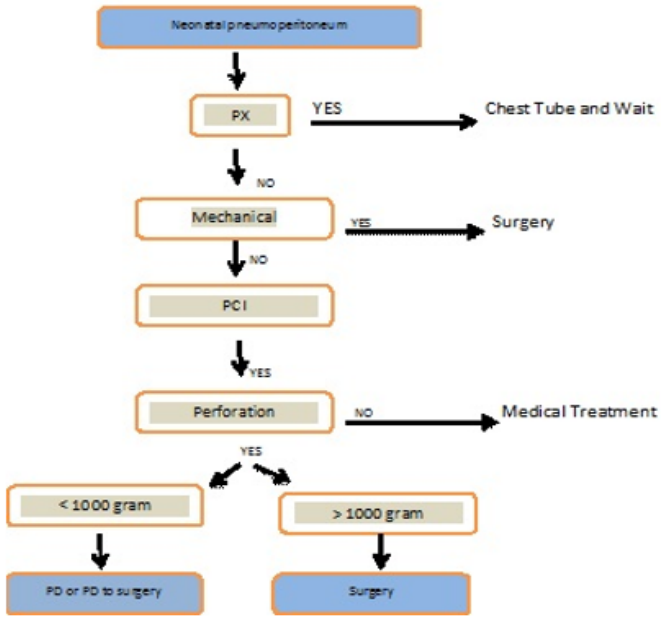


**Table 2**.Management of neonatal pneumoperitoneum

The limitations of our study, retrospective planning of the study, the low number of patients, and lack of a healthy statistical analysis in terms of comparisons among patients

under 1000 gram. In future trials, multi-centerial, prospective studies such as; only PD, only laparotomy and PD to laparotomy methods should be compared with each other in the cases of neonatal pneumoperitoneum with VLBW.

## CONCLUSION

Pneumoperitoneum; despite the advances in surgical technique and neonatal intensive care, it has serious mortality rates. PD can be used as an initial procedure prior to laparotomy especially in surgically unstable neonates below 1000 gr. BR/O and PD&W are effective surgical procedures following hemodynamic stabilization.

## ETHICAL DECLARATIONS

### Ethics Committee Approval

The study was carried out with the permission of Ethical Committe of Faculty of Van Yüzüncü Yıl (Date:04.01.2018, Decision No: 2018101).

### Informed Consent

All patients signed and free and informed consent form.

### Referee Evaluation Process

Externally peer-reviewed.

### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

### Financial Disclosure

The authors declared that this study has received no financial support.

### Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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MHA MEDIHEALTH ACADEMY

Surgery on Children

Review

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# The importance and use of defibrillation in pediatric surgery

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## ABSTRACT

Pediatric surgery is a complex and intricate medical procedure. Children have unique anatomical and physiological characteristics, which can increase the likelihood of complications during surgical interventions. Instances of sudden cardiac events and cardiac arrest are among the emergencies that necessitate immediate invention, with defibrillation being a crucial tool in such scenarios. Defibrillation is a procedure utilized to address life-threatening arrhythmia such as ventricular fibrillation and pulseless ventricular tachycardia, aiming to restore a normal heart rhythm through the application of an electric shock. In pediatric cases, defibrillation demands meticulous attention to timing and the use of appropriate energy levels to avoid potential harm and ensure effective management of surgical complications.

**Keywords:** Defibrillation, pediatric surgery, electroshock, pediatrics

## INTRODUCTION

Pediatric surgery involves the diagnosis and treatment of congenital or acquired conditions requiring surgical intervention. The role of defibrillation in addressing cardiac arrest incidents in children during surgical procedures underscores the essentiality of defibrillator utilization in surgical setting. Cardiac complications pose significant risks during pediatric surgeries. Cardiac impacting both patients and the surgical team throughout and after procedures. Understanding and effectively managing cardiac issues in pediatric patients are paramount in ensuring successful surgical outcomes and overall patients well-being.[1,2]

## COMMON CARDIAC COMPLICATIONS IN PEDIATRIC SURGERY

Pediatric surgical procedurs carry inherent risks due to the distinct anatomical and physiological characteristics of children, with cardiac complications being a primary concern. Anesthesia-related cardiac issues, surgical stress-induced complications, blood loss-related hemodynamic imbalances, and instances of cardiac arrest present critical challenges that can affect the general health and treatment outcomes of pediatric patients.[3,4]

### 1-Anesthesia-related cardiac complications

Anesthesia plays a vital role in ensuring safe and painless surgical procedures for children but may lead to certain cardiac issues. Bradycardia, hypotension, and arrhythmia are common concerns during pedaiatric surgeries, with precise monitoring and management being essential to prevent adverse effects on the heart and overall health.[3-5]

***Bradycardia:*** It is the abnormal slowing of the heart rate. Children are more sensitive to anesthesia and have an increased risk of bradycardia. The limit values of bradycardia are determined according to age 6:

1. Newborns (0-1 month): <100 beats/minute
2. Infants (1 month - 1 year): < 90 beats/minute
3. Young children (1-3 years): < 80 beats/minute
4. Pre-school children (3-6 years): < 70 beats/minute
5. School children (6-12 years): < 60 beats/minute
6. Adolescents (12-18 years): < 50-60 beats/minute

***Hypotension:*** Low blood pressure may cause cardiac complications during anesthesia. In children, hypotension may cause inadequate blood flow during surgery.[4,6]

***Arrhythmia:*** Arrhythmia is defined as irregular heart rhythm and it is a common complication during pediatric surgery. It can occur as a result of anesthesia or surgical stress and can lead to serious health problems. Accurate and rapid diagnosis and management of arrhythmia is vital in children.[3-5]

### 2-Surgical Stress and Cardiac Complications

Surgical procedures cause significant stress on the body and this may lead to cardiac complications.[3-5]

**Myocardial Ischemia:** It is the inability to provide adequate blood flow to the heart muscle. Surgical stress may increase the risk of ischemia by increasing the oxygen demand to the heart.[3-5]

**Heart failure:** It is a condition in which the heart cannot pump effectively enough during or after surgery. It is especially likely to occur after long and complex surgical procedures.[3-5]

### 3-Blood Loss and Hemodynamic Imbalances

Blood loss during surgery may cause hemodynamic imbalances and cardiac complications in children.[3-5]

**Hypovolaemic Shock:** It is a condition that occurs as a result of excessive blood loss. This condition causes the heart not to pump enough blood and the organs not to receive enough oxygen.[3-5]

***Transfusion Reactions:*** Reactions that may occur during blood transfusions may lead to cardiac complications. Children may be more sensitive to transfusion reactions.[3-5]

### 4-Cardiac Arrest

Cardiac arrest is a condition in which the heart suddenly stops pumping blood. This condition causes the flow of oxygenated blood to vital organs to stop and requires urgent medical attention. Cardiac arrest can occur suddenly and can often be fatal within a few minutes. Symptoms of cardiac arrest include sudden loss of consciousness, respiratory arrest and acrotism. Studies conducted have shown that cardiac arrest during pediatric surgery is more common in children under than 1 year of age, in children who undergo emergency surgery and in children who have American Society of Anesthesiologists (ASA) classification of III and above.[7,8] Rapid and effective intervention is required in this situation; otherwise, life-threatening consequences may occur.

In pediatric surgery, cardiac complications are an important risk factor both after surgery and during postoperative period. Complications may affect the success of surgical interventions and the general health of patients. Identification and management of these complications require the surgical team to be prepared and appropriate intervention strategies to be implemented. Resuscitation is required for the management of cardiac arrest which occurs during cardiac complications.9,10

## DEFIBRILLATOR USE DURING SURGERY

Sudden cardiac events that may occur under anesthesia during pediatric surgery necessitate the availability of defibrillators. Research shows that when performed early and correctly, defibrillation increases survival rates in pediatric cardiac arrest cases significantly. In one study, it was found that defibrillation performed at appropriate energy levels produced successful results and decreased complication risks in pediatric patients.[11] For this reason, timely administration of defibrillation requires the surgical team to be trained and prepared. Defibrillation involves the administration of electric shock to normalize the heart rhythm. It should be performed in case of cardiac arrest. Cardiac arrest occurs when the child is unconscious, has no pulse and stops breathing. The four fatal rhythms that may occur during cardiac arrest are ventricular fibrillation (VF), pulseless ventricular tachycardia (nVT), pulseless electrical activity and asystole. In cases of VF and nVT, shock with defibrillator is required.[9,10]

### Ventricular Fibrillation (VF)

VF is a condition in which the ventricles of the heart make irregular and rapid contractions. In this arrhythmia, the heart cannot pump blood effectively and rapid defibrillation is required. VF is one of the most common causes of cardiac arrest and may be fatal if not treated urgently.[9-10]

### Pulseless Ventricular Tachycardia (nVT)

nVT is a condition in which chambers of the heart contract rapidly but cannot pump blood effectively. Defibrillation is required in this condition when no pulse can be taken.[9-10]

### Asystole

It is a condition in which the electrical activity of the heart stops completely and ECG (electrocardiogram) appearance known as “flat line” appears. Asystole is one of the most fatal forms of cardiac arrest and defibrillation is not effective. Treatment occurs through cardiopulmonary resuscitation (CPR) and adrenaline.[9-10]

### Pulseless Electrical Activity (PEA/NEA)

NEA is the absence of an effective contraction and therefore pulse, despite the persistence of electrical activity of the heart. NEA can occur due to a variety of underlying causes and treatment involves identification and correction of the underlying causes. CPR and epinephrine administration are required.[9-10]

## DEFIBRILLATOR USE AND ADMINISTRATION PROTOCOLS

Defibrillation is performed in accordance with the protocols specified in the guidelines of authorities such as American Heart Association (AHA) and European Resuscitation Council (ERC). In pediatric patients, defibrillation can be performed with an automatic external defibrillator (OED) or manual defibrillator. Defibrillator is used by healthcare professionals. Healthcare professionals should determine the energy level in shockable rhythms depending on the age and weight of the child.

The effectiveness and safety of defibrillation varies depending on the age and weight of the child. Defibrillation can be

administered to all age groups except newborns (0-28 days). However, defibrillation methods and device selection vary depending on age and weight[9,10,12,13]

**Infants and young children (1 month-8 years):** OED or manual defibrillators may be used in this age group. The use of spoons/pads and settings is recommended while using defibrillators. Manual defibrillators have pediatric spoons placed inside adult spoons. Pediatric spoons/pads provide safe defibrillation by reducing the shock energy.[9]

**Older children and adolescents (8 years and older):** Adult OEDs and manual defibrillators can be used in children aged 8 years and older. Adult spoons/pads and settings are suitable for defibrillation in this age group.[9]

During the administration of defibrillator, the placement of spoons/pads should be adjusted as sternum-apex. There should be a distance of at least 3 cm between the spoons or pads. If the spoons/pads are not of the appropriate pediatric size for children under 8 years of age, they should still be used, but the placement should be anteroposterior because when placed as sternum-apex, the 3 cm distance between them may not be provided and the spoons/pads may overlap. Spoons should contact the body fully. A weight of approximately 3 kg should be applied to the spoons in children under 10 kg and approximately 5 kg should be applied to the spoons in children over 10 kg. Energy level selections should be administered at the recommended doses according to AHA and ERC guidelines during defibrillation. According to AHA 2020 guidelines, while the first shock is administered as 2 J/kg, it is recommended to administer the second shock as 4 J/kg and the consequent shocks as >4 J/kg. It has been stated that a maximum dose of 10 J/kg or adult dose should not be exceeded. According to ERC 2021 guideline, it is recommended for the first shock to be administered as 4 J/kg, the consequent ones to be administered as 4J/kg and in case of persistent VF/Nvt (>5 shock), the shock dose should be increased gradually. It has been stated that maximum dose of 8 J/kg or 360J value should not be exceeded.[9,10,12-14]

## Defibrillator Use Skills[15,16]

**1**- Preparation of materials

**2**- If there is wetness or moisture on the child's chest, it should be dried

**3**- Pediatric size spoons should be removed

**Figure 1**. Pediatric size spoons removed from the adult size defibrillator spoons

**4**- Defibrillator should be switched on from the On/Off button

**5**- Depending on the characteristics of the monitor, there may be some differences in switching to child mode. The defibrillator is switched from off to on while pressing and holding the button labelled child mode.

**Figure 2**. Defibrillator

**6**- Energy level should be chosen as Joule (J) (in accordance with the recommendations of AHA/ERC guidelines)


**Figure 3**. Buttons on the defibrillator

7-The charge button on the defibrillator or also on the spoons is pressed on the defibrillator or on the spoonsto charge it.

**Figure 4**. "charge" buttons on the defibrillator and spoons

8- If there are individuals contacting the child, they are sent away.

9- Warnings are made such as defibrillator is being charged, do not contact the child, do not approach.

**10**- The spoons/pads should be placed as sternum-apex or anteroposterior

**11**- If pads are to be used, spoons should be removed and pads should be connected to the defibrillator


**Figure 5**. The visual showing defibrillator pads and placement

**12**- After the defibrillator is charged, make sure that everyone, including you, is not touching the pediatric patient.

**13**- Energy should be discharged by pressing the discharge button on the defibrillator or the spoons.

**Figure 6**. "discharge" buttons on the defibrillator and spoons

**14**- After giving shock, the spoons should be placed on the defibrillator. If a pad has been used, it should remain adhered to the child's breast.

## CONCLUSION

The relationship between paediatric surgery and defibrillation is critical especially in terms of cardiac complications that may occur during and after surgery. Defibrillation is an important tool for the surgical team to intervene immediately and correct administration is vital in terms of improving surgical results.[17] As stated in the literature, the effectiveness of defibrillation practices is directly associated with the preparation of equipment and training of the team. Therefore, pediatric surgery teams should be well-trained and prepared in this regard.[9,10]

## ETHICAL DECLARATIONS

### Referee Evaluation Process

Externally peer-reviewed.

### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

### Financial Disclosure

The authors declared that this study has received no financial support.

### Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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# The localization, treatment, and complications of dermoid cysts in the eyebrow region

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## ABSTRACT

Dermoid cysts are congenital lesions characterized by skin appendages and surrounding epithelial tissue with a well-defined cyst wall, accounting 40% of all pediatric lesions. The most common location is frontotemporal, orbital and Nas glabellar region. Diagnosis is based on physical examination and imaging in selected cases. Surgical excision is recommended as the preferred course of treatment. Presentation, classification, differential diagnosis, imaging methods and algorithms, surgical techniques and complications are discussed based on the recent literature.

**Keywords**: Dermoid cyst, eyebrows, surgery

## INTRODUCTION

Dermoid cysts, which are congenital lesions (choristomas), arise from the inclusion of ectodermal tissue during the closure of the neural tube. These cysts predominantly manifest along the midline and at the fusion lines of the epithelium. During cranial bone development, the periosteum and embryonic ectoderm align at the definitive suture lines. It is hypothesized that ectodermal fragments may become entrapped as these suture lines close, subsequently developing into dermoid cysts in this ectopic location.[1,2]

Dermoid cysts are characterized by the presence of skin appendages and epithelial tissue, and they possess a well-defined cyst wall. Dermoid cysts typically present in early infancy as asymptomatic, soft, and slowly growing masses with limited mobility. In a retrospective analysis of 280 cases conducted by Pushkar et al., it was noted that 6% of the lesions were present at birth, of which 4% manifested with proptosis, and 70% were diagnosed within the first year of life. As they increase in size, they can become challenging to excise in older individuals.[2,3]

### Localization, Classification and Presentation

Dermoid cysts account for 40% of all pediatric orbital lesions and 89% of all pediatric cystic orbital lesions, establishing them as the most predominant form of orbital cysts. The majority of these lesions manifest within the initial three months of life or are present at birth, slow-growing and do not transilluminate.[4–6]

There are reports indicating that 7-80% of all dermoid's occur in the head and neck region, primarily in the orbital and periorbital areas.[7,8] Bartlett identified three clinical groupings of orbitofacial dermoid's after reviewing 84 cases: frontotemporal (64%), orbital (25%), and Nas glabellar (11%).[9] The majority of periorbital lesions are located at the external angle of the brow in the lateral brow region, are extra orbital, and originate in the frontozygomatic suture area.[4,10,11]

The frontotemporal group typically presents as distinct, slowly growing masses that are superficially located, anterior to the orbital rim, and do not extend deeply. They typically manifest early in life as mobile, well-defined, soft-tissue masses. These masses can be excised directly, eliminating the need for an extensive diagnostic work-up.[9] Deeper orbital dermoid's, situated posterior to the orbital rim, tend to grow slowly and may not be recognized until later in life, potentially leading to bone erosion. In the retrospective analysis conducted by Pushkar et al.,[2] 71% of the cysts were found to be superficial, while 29% were deeply located. In some patients, a superficial

brow mass may become less clinically apparent over time. In these cases, suspicion of transcranial extension should be considered.[7]

Cysts may adhere to the periosteum or be subperiosteal, and they can extend through the bone into the orbit. The simultaneous occurrence of infraorbital and extra orbital locations is possible. This circumstance often leads to delayed diagnosis and increased surgical complexity. In cases of infraorbital cysts, proptosis or abnormal ocular motility may manifest.[10] They can also extend intracranially.[12] Periorbital dermoid cysts that extend across a bone suture line are commonly referred to as "dumbbell dermoids".[13]

The ectopic placement of neuroectoderm results in the formation of nasal dermoid's. Nazoglabellar dermoids arise early in embryonic development during the closure of either the anterior neuropore, the fonticulus nasofrontal is, or during the development of the frontonasal process. The final theory, first described by Grunwald in 1910 and later termed the "prenatal theory" by Pratt and the "cranial theory" by Bradley, proposes that as the neuroectodermal tract recedes, it may drag dermal attachments along.[14–16] The failure of the dura to properly separate from the dermis results in retraction of nasal cutaneous elements by the retracting dura. Consequently, as the dura withdraws from the prenatal space, the nasal ectoderm is drawn upwards and inwards, the nasal cutaneous elements can become trapped anywhere along the path from the dura to the skin, forming an epithelium-lined sinus or cyst. Consequently, nasal dermoid's can arise from the columella to the glabella and present as a midline nasal mass, pit, or sinus. Midline dermoid cysts may distort nasal growth.[12,17,18] Half of children may present hypertelorism and a broadened nasal bridge.[19]

Periorbital dermoid cysts can exhibit a wide range of locations. There is a reported case of an inferonasally located dermoid cyst that was previously believed to originate from the lacrimomaxillary suture line and was bisected by the inferior oblique muscle.13 Dermoid cysts can also present in the upper eyelid, often resembling a chalazion.[20,21]

Rare presentations include dimple formation, visible sinus opening in the brow region, lacrimal drainage obstruction symptoms, proptosis, abscess or fistula formation, periorbital or preseptal cellulitis, osteomyelitis and bone defect.[1,6,7,17]

## Diagnosis and Imaging

In the preoperative assessment, radiography may be employed. Intracranial extension or bony destruction is less commonly reported in association with non-midline dermoid cysts, such as those located in the lateral brow region.[5] However, there are also studies reporting that bony changes accompany in 75% of the cases.[2] Radiography is advised if the cyst is immobile upon examination. If anomalies are detected on plain film, a CT or MRI scan may be warranted. Ultrasound is not considered a highly useful method for diagnosing and planning surgery for dermoid cysts, it generally identifies a cyst that is ovoid, hypoechogenic, and heterogeneous, with well-demarcated outer margins and positive posterior acoustic enhancement.[22] In cases where the mass lacks mobility during physical examination or for orbital dermoid cysts with indistinct borders, consideration should be given to the possibility of bone adherence or deeper extension, necessitating a CT or MRI scan.[1,10] For cysts located more than 1 cm away from the brow margin, imaging with CT or MRI is recommended to assess for intracranial extension, considering that they may originate from the pterional region (the point where the temporal, frontal, parietal, and sphenoid bones meet).[4] Lesions typically remain unchanged in size with Valsavla maneuver; however, those that exhibit growth are believed to possess an intracranial extension component.[5]

According to a retrospective review conducted in 2019 at Bernard and Millie Duker Children's Hospital at Albany Medical Center involving 28 patients, surgical excision without preoperative imaging is recommended for patients who exhibit no orbital symptoms and have superficial, mobile lesions that do not change with the Valsalva maneuver. Conversely, for deep lesions with limited mobility, surrounding bony hypersclerosis, orbital symptoms, or changes with the Valsalva maneuver, preoperative CT or MRI is recommended to assess for intracranial extension.[5] In pediatric cases, MRI is recommended to eliminate the radiation exposure.[2]

A meta-analysis of several studies indicates that nasal dermoids may be associated with cerebral extension, with an incidence rate of 20%, but ranges from 4% to %57 in different studies, and it is impossible to determine clinically.[19] It is imperative that all individuals presenting with midline nasal tumors undergo imaging to ensure an accurate diagnosis and to exclude the possibility of cerebral extension.[5,7,12,23] In a retrospective study conducted by Amin et al.[24] in 2024, involving 129 patients with frontonasal dermoids, CT and MRI were concordant in predicting intracranial extension.

Dermoid cysts and epidermoid cysts are occasionally conflated. Histologically, dermoid cysts consist of stratified squamous epithelium (ectoderm) with accompanying skin appendages surrounding a cavity containing keratin, sebaceous glands, calcium, cholesterol crystals or lipid debris, smooth muscle, and hair (adnexae, mesoderm).[4,7,17,25] The term "epidermoid cyst" is more suitable when the cyst is lined with keratinizing squamous epithelium but lacks skin appendages.[10] Differential diagnoses also include hemangioma, teratoma, neurofibroma, lipoma, epithelial inclusion cyst, hydatid cyst, cold absess, encephalocele, meningocele, meningoencephalocele, cystic schwannoma, glioma. A nasal dermoid is a non-expansile and non-pulsatile mass that is not compressible and does not transilluminate. A hair visible in the skin ostium is considered to be pathognomonic for nasal dermoids. Differentiation from hemangiomas and teratomas can be achieved using gadolinium contrast-enhanced MRI imaging. Contrast-enhanced CT can be utilized to differentiate meningocele, cystic schwannoma, or abscesses. Unlike encephaloceles, the mass does not exhibit enlargement either during spontaneous crying or consequent to jugular vein compression (negative Furstenberg's sign) and the Valsalva maneuver.[2,6,12,19]

## Treatment

All orbitofacial dermoids are managed through total surgical excision. Complete cystic wall removal are the gold standard of treatment. Despite their histologically benign nature, these lesions have a propensity for growth, which can lead

to fascial asymmetry, orbital displacement or bone erosion. Therefore, surgical excision is recommended as the preferred course of treatment.[4,11,26] Beyond cosmetic concerns, removal is necessary to prevent infection and its associated complications, such as local abscesses, periorbital cellulitis, osteomyelitis, meningitis, cavernous sinus thrombosis, intracranial abscesses, and malignant transformation. In cases of nasal dermoids, the annual incidence rate of infection is estimated at 7% throughout childhood. Owusu-Aim et al.[1] observed that by the age of 4, half of the children with nasal dermoids experience at least one localized infection, with over 90% experiencing infections before reaching their 9th year.[6,10,17,19,27]

To ensure that a dermoid cyst does not recur, complete surgical excision must include the removal of the entire epithelial lining. If the cyst ruptures during surgery, the surgical field should be irrigated with a solution containing antibiotics and saline. Irrigation with corticosteroids has also been reported.[6] Cysts adherent to the periosteum should be excised en bloc with the periosteum. Sclerosing agents offer a minimally invasive alternative. These methods, including needle aspiration for decompression, methylene blue for wall delineation, or preemptive removal of a nearby small bone fragment, are also described in the literature to assist the surgeon.[28] It is crucial to bear in mind that intracranial extension can occur even in the presence of a fibrous cord lacking dermal elements during excision.[1,4] If a pit is present externally, it should be excised using an elliptical incision.[12]

The incisions used to access lateral eyebrow dermoid cysts can be placed directly over the lesion, above or below it, or through the eyebrow. To reduce visible scarring, some authors recommend an incision along the upper lid crease. The upper eyelid crease incision principle was first described in 1988. If an incision along the upper eyelid crease is to be used, the dissection plane should be below the orbicularis oculi muscle and above the orbital septum. This approach ensures the preservation of the lacrimal gland, levator aponeurosis, and extraocular muscles.[4,10,29]

In 2006, Park et al. published a case report which includes a modification of an upper eyelid crease incision. In this method, the authors advanced through an upper eyelid crease incision, navigating in the plane superior to the orbicularis oculi muscle to access the superior surface of the mass. By splitting the orbicularis oculi muscle immediately above the mass, they minimized the risk of inadvertently damaging the orbital septum and reduced potential harm to the underlying levator aponeurosis and lacrimal gland. Furthermore, the authors posited that this approach would mitigate postoperative swelling and ecchymosis.[11]

Approaches through the orbitonasal crease (Lynch incision) and the lateral canthus have also been documented in the literature. For midline nasoglabellar dermoids; midline vertical incision, transverse incision, inverted "U" incision and medial paracanthal incision has been described. Lateral rhinotomy, external rhinoplasty and endoscopic approaches can be used in selected cases.[11,12,30] In 2022, Diab et al. published a study comparing three different incision techniques for the removal of internal angular cysts: lid crease, sub-brow, and direct mini-incision. According to the results of this study, both the lid crease and direct mini-incision approaches result in superior scar quality with minimal visibility compared to the sub-brow technique. However, the lid crease technique is associated with a prolonged operation time, particularly for cysts located outside the orbital rim.[31] In 2023, Pushker et al. described the transconjunctival excision of external angular dermoid cysts as a treatment option for patients presenting with a mobile cyst confined to the eyelid and lacking an evident bony fossa. Nevertheless, this approach demands surgical expertize, affords limited surgical access, and entails a gradual learning curve.[32]

The endoscopic technique may be favored due to its minimally invasive nature and the resulting reduced visibility of scarring. This method was first described in the English literature for the treatment of dermoid cysts in 2004 by Chen and Lachica in two separate publications. Chen et al. accessed and excised the masses through two 1.5 cm incisions along the anterior hairline. No recurrence was observed during the seven-month follow-up period.[33,34] Senchenkov et al. published a case series in 2005 detailing the successful surgical management of eight patients utilizing the endoscopic approach.[3] In 2006, a case series involving nine patients was published by general surgeons, who utilized the endoscopic method. No intraoperative or postoperative complications were reported.[35] In 2016, Lopez et al. published a case series involving 23 pediatric patients with dermoid cysts of the brow underwent excision by endoscopy. The dissection was carried out through the subgaleal plane, no complications were reported. A thorough understanding of the local neural structures, the temporal branch of the facial nerve, the supratrochlear nerve, and the supraorbital nerve, is essential for performing endoscopic surgery on the forehead. The dissection plane can be either subgaleal or subperiosteal. The subgaleal plane is preferred for its bloodless nature and offers a more direct approach to soft tissue.[25]

Foster et al. presented a review article contrasting open and endoscopic methods in 2018. In the endoscopic approach, a subgaleal plane was utilized, whereas for patients with a direct incision, the approach was made directly over the mass. The authors observed hypopigmentation in the scar of one patient who underwent the open approach. Consequently, despite the absence of a statistically significant difference, they opted to adopt the endoscopic approach. They also stated that they do not prefer preoperative imaging unless the mass is immobile or located in the midline. Furthermore, they indicated that although the endoscopic approach could utilize 2, 3, or 4 ports, they chose to employ a single port to reduce postoperative scarring. Only one case of recurrence was observed, which necessitated reoperation. The text indicates that the endoscopic approach carries a risk, albeit low, of sensory or motor nerve damage. Temporary eyebrow ptosis was observed in two patients from the endoscopic group and one patient from the direct approach group. This phenomenon was attributed to postoperative edema or nerve stretching. It is suggested that adhering to the appropriate plane can reduce this risk. Additionally, the study notes that despite similar complication rates, overall patient and surgeon satisfaction tends to be higher with the endoscopic approach without a facial scar.[26]

Despite the absence of transosseous penetration of the dermoid cyst into the orbit, the incidence of bone anomalies remains high. Consequently, subperiosteal dissection to liberate the deeper portion of the cyst is recommended. This approach serves to prevent cyst perforation or the inadvertent retention of residual lesions.[10]

In cases of intraorbital extension, accessing the orbital roof through a subperiosteal plane via an incision at the superior orbital rim periosteum can minimize inadvertent trauma to the intraorbital contents, thereby facilitating the excision of the cyst.10 Lateral or medial orbitotomy approaches have also been described.[6]

If no intracranial extension is observed, an external approach can be employed. However, in cases of intracranial extension, a combined intra- and extracranial approach involving craniotomy, orbitotomy, or rhinotomy may be necessary.[1] The traditional technique necessitates the removal of any extension that traditionally required a frontal craniotomy and bicoronal incision, procedures that are associated with a significant risk of morbidity. In 2007, Heywood et al. published a retrospective study detailing a novel minimally invasive technique for the excision of the intracranial component of dermoid cysts with a brow incision and small window craniotomy.[12] In 2020, Hidalgo et al. described a method for excising nasocranial dermoids that involves the combination of a small frontal craniotomy with an inverted-V open rhinoplasty approach through the columella.[36]

### Complications

Early postoperative swelling, erythema and mechanical ptosis may be observed after surgery.[4,10] Protracted swelling, bruising or bleeding, infection, wound dehiscence, pain, dry eye or conjunctivitis, keloid or hypertrophic scarring, ptosis and theoretical risk of blindness are the complications of the surgery. Patients who undergo brow incisions may experience brow alopecia and deformity. In endoscopic procedures, there is a potential risk of damage to the facial nerve. The endoscopic approach may be constrained by the pronounced curvature of the skull in certain infants.[4]

Incomplete excision can lead to recurrence, and recurrences may present as chronic lipogranulomatous inflammation, cutaneous fistulas or discharging sinuses.[1,2] The probability of recurrence is significantly increased if any dermal components are left behind.[12]

Excision of nasal dermoids using conventional techniques can result in complications such as meningitis, hyposmia, cerebrospinal fluid leakage, damage to the frontal and sagittal sinuses, and, in some cases, intracerebral hemorrhage, cerebral edema, epilepsy, memory and concentration deficits, and osteomyelitis of the frontal bone flap. To prevent these complications, if dural damage occurs during surgery, it should be repaired using a periosteal patch, temporal fascia, or fascia lata. Hair loss along the incision line can be seen.[12]

## DISCUSSION

An analysis of current literature, integrated with the author's clinical experience, underscores the importance of early total excision with complete cyst wall removal in preventing recurrence and minimizing complications in dermoid cysts. Effective preoperative planning is essential to mitigate the risk of recurrence. Imaging should not be omitted if there is suspicion of bony changes, intraorbital or intracranial extension. While external excision may appear straightforward, achieving total excision, particularly in cases with bony involvement, necessitates subperiosteal extirpation and potentially the shaving of the underlying bone.[2,6] In instances of intracranial extension, collaboration with neurosurgeons is imperative, and intraorbital extension requires the involvement of ophthalmologists. A multidisciplinary approach is crucial. Early excision is pivotal in minimizing future bony erosions and reducing preoperative, intraoperative, and postoperative complications.

When evaluating surgical techniques, the upper eyelid incision is recognized as the method that results in the least scarring among direct excision techniques. However, for patients with significant concerns about scarring, endoscopic methods may be preferable. Although incisions made directly over the lesion provide convenient access, they tend to result in more conspicuous scarring compared to other approaches. If the upper eyelid incision is employed, maintaining the dissection above the orbital septum ensures a safe surgical plane. In endoscopic procedures, a subgaleal or subperiosteal plane is recommended to avoid damage to motor and sensory nerves.[6] Novel approaches like the transconjunctival approach may be considered in suitable cases.[32]

In our study, we aimed to summarize the epidemiological characteristics, localization, presentation, classification, imaging modalities, differential diagnosis, treatment strategies, and complications associated with dermoid cysts in the eyebrow region through a comprehensive review of the contemporary literature. It is important to note that our study represents a review of existing literature and does not encompass a meta-analysis incorporating statistical methodologies. While the largest study we encountered in our review comprised 280 cases, there remains potential for further research with broader sample sizes in this domain.

Our study underscores the critical necessity of meticulous preoperative planning and thorough imaging in the excision of dermoid cysts, particularly prevalent in pediatric populations. Additionally, we emphasize the imperative for a meticulous surgical approach and the significance of not trivializing the complications associated with this procedure. It is recommended to stay abreast of current approaches and literature in this field.

## CONCLUSION

Dermoid cysts located in the brow region necessitate surgical excision due to cosmetic concerns and potential complications. Preoperative physical examination and imaging are crucial for surgical planning. Multiple direct and endoscopic excision methods are available for surgical intervention. Masses with intracranial and intraorbital extensions require a multidisciplinary approach.

## ETHICAL DECLARATIONS

### Referee Evaluation Process

Externally peer-reviewed.

### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

### Financial Disclosure

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### Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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# Care of a patient who underwent salpingo-oophorectomy due to ovarian tumour according to kolcaba comfort theory: a case report

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## ABSTRACT

Nursing theories and models provide a framework for professionally organised nursing practice. One of the nursing theories that has an important place in nursing is 'comfort theory'. Developed by Katharine Kolcaba, comfort theory offers a broad perspective on nursing. In this study, the problems experienced by a 15-year-old patient who was diagnosed with a right ovarian tumour and underwent salpingo-oophorectomy were assessed from the perspective of comfort. Our study aims to provide an example of the application of comfort theory in paediatric surgical clinics.

**Keywords**: Kolcaba, comfort theory, surgery, nursing care

## INTRODUCTION

The French word "confort" is derived from the Latin word "forting". It is used synonymously with the word "comfort" in Turkish. According to the Turkish Language Association (TDK), the word "comfort" is defined as "It is a living situation or environment in which a person feels comfortable and peaceful, does not feel any physical and mental discomfort, and provides convenience".[1] The North American Nursing Diagnostic Association (NANDA) defines comfort as a feeling of psychological, physical or social well-being or comfort.[2]

The concept of "comfort" in nursing science has been discussed by many nurse theorists. Florence Nightingale was the first to mention comfort in nursing written sources.[3] In Peplau's theory, comfort is considered a basic need, while in Orlando's theory, it is physical and mental comfort and the evaluation of situations that increase comfort. In Roy's adjustment model, comfort is evaluated within the framework of psychological comfort. In Watson's model, comfort is generally seen as a variable of interest.[4]

A theory is a system that provides meaning to concepts, renders them multidimensional, and establishes relationships between them. A theory is a set of concepts that are validated through the application of scientific methods to test observations and propositions.[5] The "Comfort Theory," developed by Katharine Kolcaba in 2003, enables a more systematic examination of the problems faced by care recipients and the development of The theory offers professional and user-friendly plans for nursing practice. According to the theory, comfort is defined as a response to problems arising from physical, socio-cultural, psycho-spiritual and environmental aspects at three levels: relaxation, refreshment and problem solving. Kolcaba examined the categorical structure of the two-stage theory, namely comfort level and comfort dimension.[6,7] According to the comfort theory, comfort levels consist of three stages: relief, relaxation and superiority. Relief is the feeling of satisfaction when an individual is relieved from a state of distress. It is experienced as a result of the fulfillment of any need.[2] Relaxation is a state of calm and peaceful existence. Transcendence is the state of being able to overcome problems by increasing one's own power. This is possible when comfort needs are fully satisfied.1 In theory, comfort elements are defined in four stages: physical, socio-cultural, psychospiritual and environmental.[3]

### 1-In The Physical Dimension

Comfort requirements are related to bodily sensations. This encompasses physiological factors such as immune function, responses to illness, rest, nutrition, relaxation, nausea and vomiting.[4]

### 2-Sociocultural Comfort Requirements

It includes the individual's social relationships, rituals, family traditions and beliefs. The sociocultural dimension of comfort encompasses interpersonal relationships and interactions with social institutions. The scope of this category also encompasses traditions, rules and legal regulations that regulate social and interpersonal relations.[3]

### 3-Comfort Needs İn The Psycho-Spiritual Dimension

The psychospiritual dimension encompasses the cognitive, emotional and psychological components of comfort needs. This encompasses the individual's mental, psychological and spiritual state (self-confidence, self-esteem, sexuality, meaning of life).[6,8]

### 4-Environmental Comfort Requirements

Environmental comfort needs are related to the external environment of the individual. This encompasses the impact of physical factors, such as light, temperature, smell, sound, colour and landscape, on individuals.[2]

In order to implement the comfort theory, it is first necessary to determine the comfort needs of the individual by utilising the categorical structure of the theory. The nurse should ascertain the comfort level of the individual prior to providing care. Subsequently, they should assess the patient's physical, psycho-spiritual, environmental and sociocultural comfort needs with a holistic approach and apply nursing approaches to meet unmet needs. It is then necessary to re-measure the comfort level, evaluate the results of the expected increase in comfort and design a new plan appropriate to the situation.[5,6] In this case report, the nursing care plan of a patient who presented to the emergency department with severe abdominal pain, vomiting and constipation was planned and evaluated according to the comfort theory.

### Ethical Dimension

Before obtaining information from our patient, information about the research was given. Written and verbal consent was obtained.

### Diagnostic Tool

In this study, patient-related data were collected using Kolcaba Comfort Theory and summarised below.

## CASE

A 15-year-old girl presented to the emergency department with nonspecific symptoms including nausea, abdominal pain, weakness and restlessness which started two days ago. She additionally reported that her symptoms were accompanied by malaise and vomiting. Two days ago, she reported constipation and underwent an enema. Following the enema, she defecated, yet her complaint of pain intensified. In his past medical history, he reported experiencing intermittent abdominal discomfort and stated that he was taking analgesics. The patient's height was 158 cm, weight was 70 kg, general condition was moderate, and colour was pale. No chronic disease was identified in the patient's past medical history.

A physical examination revealed marked distension, tension, and diffuse tenderness in the lower abdomen on auscultation. The patient exhibited severe abdominal pain, and palpation of the right lower quadrant of the abdomen revealed an orange-sized mass with regular borders. Laboratory tests revealed the following results: hemoglobin: 11.2 g/dl, hematocrit: 34.0%, white blood cells (WBC): 14.12 mg/dl, sodium (Na): 130 mEg/l, C-reactive protein (CRP): 5.2 mg/L, lactate dehydrogenase (LDH): 325 units/L, and electrolyte values were within optimal limits. Liver and renal function tests were within the normal range, as were cardiac enzymes and the electrocardiogram (ECG). In the radiological examinations, the bladder contours were regular, the uterus was in a normal size and configuration in abdominal ultrasonography. The left ovary exhibited a normal nuclear structure, while a limited mass was identified in the right ovary. Oxygen was administered via a mask, and fluid resuscitation was initiated with an isotonic infusion at a rate of 200 cc/h. A blood group study was conducted to determine the necessity for transfusion, and two units of erythrocyte suspension were prepared.(Table 1)

**Table 1. Vital signs of the patient in the emergency department**

| Heat | Pulse | Respiratory rate | SPO2 | Blood pressure |
|---|---|---|---|---|
| 37,0 C | 110/ mins | 27/ mins | 87 mmHg | 110/85 mmHg |

All preoperative preparations were completed on time, and the patient was subsequently taken into surgery. During the surgical procedure, an incision is made between the lower and upper quadrants of the abdomen. The mass was excised from the surrounding tissues. (Figure 1)

**Figure 1**. Mass of tumour already separated from surrounding tissue

During surgery, the ovary was found to be 5.5 torsion and the ovary was detorsionised. After the ovarian torsion was corrected by detorsion, the ovarian blood supply was insufficient (presence of ischaemic tissues). Necrotic tissues were also present around the tuba. There was haemoperitoneum, and

the salpinx and ovary were resected(Figure 2). The other over was in natural appearance. Following the excision of the mass, the incisions were properly closed, and there was no intraoperative bleeding or complications. (Figure 3)

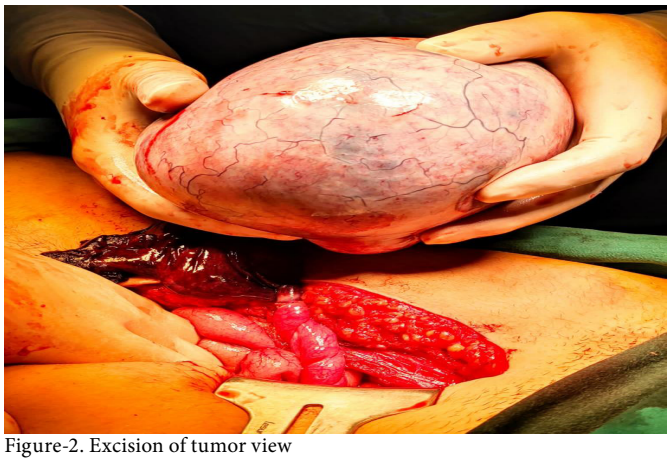
Figure-2. Excision of tumor view


**Figure-3**. The mass was dissected from the tissues in the area

The intraoperative rapid pathology examination revealed no evidence of malignancy, and the operation was completed. In the postoperative interview with the patient, she reported experiencing postoperative pain and expressed concerns about the risk of tumour recurrence.

The comfort level of the preoperative clinical presentation was measured as low as 1.58 on the General Comfort Scale (GCS). It was recognised that the patient's comfort was low before the operation and that she had adjustment problems.

The General Comfort Scale (GCS) is a 48-item Likert-type scale developed by theorist Kolcaba in 1992. Its Turkish validity and reliability were determined by Kuğuoğlu and Karabacak. The scale comprises 16 items pertaining to relief, 17 items pertaining to relaxation, and 15 items pertaining to coping. In the scale where positive and negative sentences are mixed, the score indicating a high degree of comfort in a positive sentence is 4, while the score indicating a high degree of comfort in a negative sentence is 1.3 The score that can be obtained from the scale can vary between 48 and 192. The obtained score is divided by the number of items on the scale, namely 48, in order to determine the comfort level, which ranges from a maximum score of 4 to a minimum score of 1.1

The general comfort scale is created using a classification structure consisting of three levels and four dimensions that form the theoretical components of comfort as a guide. This structure is used to define comfort-related requirements and to assess the situation in order to achieve the expected level of comfort with nursing.[6] Interventions are planned to provide the desired comfort. The nursing diagnoses and interventions for the problems encountered by the patient are defined according to the classification structure of the comfort theory.[2]

## 1-Physical Dimension

A patient who had experienced postoperative pain in the incision area was administered analgesics in accordance with the physician's orders. Additionally, distraction techniques, such as watching movies and listening to music, were employed. It was observed that the patient exhibited a painful facial expression and a painful posture during walking. The patient's pain was evaluated using the Visual Pain Scale. Prior to treatment, the patient's pain score was recorded as 8, and following treatment, this decreased to 2. Furthermore, the patient indicated that her pain had been reduced in verbal communication.

Following surgery, the patient with constipation was informed of the potential for changes in excretory function, received comprehensive education in collaboration with the hospital nutritionist, and an appropriate diet list was created.

The patient was mobilised five hours after surgery and required assistance to transfer from the bed to a chair. A programme of passive range of motion exercises, slow and short activities, and rest periods was arranged in bed. The patient was encouraged to participate in their own care and rehabilitation, with the assistance of their parents. The patient's daily activities were gradually increased, and he was included in daily self-care activities and was allowed to pass independently.

The patient was found to have respiratory dysfunction due to prolonged anaesthesia and immobility. The patient was supported to use deep breathing exercises and spirometry to breathe comfortably. The patient was supported to use the deep breathing exercises taught before the operation and to use spirometry. With these applications, the patient's lung vital capacity was increased and optimal respiratory function was achieved.

## 2-Psychological Dimension

The patient presents with a psychological issue pertaining to the deterioration of their individual identity, which is believed to be related to the postoperative changes that have occurred. It is observed that the patient exhibits behaviours such as hiding the surgical incision site, shaming, and avoiding discussion of the subject. The patient was informed that it was acceptable to accept her body image and was reassured. An appropriate setting was established, and the patient was afforded the chance to articulate her emotions and concerns.

The patient exhibits a fear of the future as a consequence of the surgical procedure she has undergone. The patient

expressed concern about the possibility of the tumour recurring. It was determined that the patient exhibited a negative self-perception regarding her condition. The patient was encouraged to maintain eye contact and to express her feelings. It was emphasised that patients should be at peace with their body image and that their fears were, in fact, manageable. They were supported in seeking professional help.

The patient feels insecure because she thinks that her ovary was damaged during the removal of the tumour. She thinks that this situation will cause people to judge her in the future. She has general adjustment problems and ineffective coping. Both the patient and her family lack knowledge about basic health practices and health behaviour development. In order to deal with this situation, it is necessary to identify their concerns. The patient and her family were supported to ask for information. Information was given about the structure of the ovary and the post-operative status.(Table 2)

**Table 2: Nursing Care of the Individual with Salpingo-Ooophorectomy Surgery According to the Taxonomic Structure of Comfort Theory**

| Comfort dimensions | Comfort levels | | |
|---|---|---|---|
| | Relief | Relaxation | Finding meaning |
| **Physical** | | | |
| Pain due to impaired physical integrity after surgery | To alleviate the patient's discomfort, a combination of pharmacological and non-pharmacological treatment modalities should be employed | The administration of analgesic agents to relieve the patient of discomfort resulting from pain-oriented applications. | The development of coping strategies for pain is a key aspect of the therapeutic process. |
| The changes in intestinal emptying that have been observed have been associated with an increased prevalence of constipation | It is important to be aware of the physical processes involved in intestinal emptying, as this can help to overcome the lack of knowledge about the changes that occur.<br>In order to ensure a balanced diet for the patient, it is necessary to ensure that adequate fluid is removed on a daily basis.<br>When switching to a solid diet, it is important to ensure that the pulp is included in the diet, as this helps to ensure the inclusion of nutrients. | The implementation of planned anti-constipation interventions to relieve the patient. | It is important to adhere to the prescribed diet list in order to maintain the effectiveness of anti-constipation interventions. |
| Pain related; activity intolerance | The application of in-bed active-passive range of motion exercises<br>The planning of slow and short activities by adjusting rest periods<br>The application of in-bed active-passive range of motion exercises<br>The planning of slow and short activities by adjusting rest periods<br>In order to encourage the semi-dependent to engage in self-care, it is necessary to provide incentives. | It is recommended that patients engage in regular exercise, relaxation techniques and increased mobility. | The objective is to enhance the activities of daily living by gradually increasing activity and promoting the ability to pass independently. |
| Prolonged anaesthesia, resulting from immobility, has been shown to impair respiratory function | In the preoperative period, the patient is taught breathing exercises.<br>The purpose of this article is to provide information about the use and importance of spirometry. | It is recommended that adequate ventilation be provided in order to facilitate relaxation | The patient is instructed to engage in the breathing exercise previously demonstrated to them prior to the surgical procedure. |
| **Psychospiritual** | | | |
| Following the surgical intervention, there was a deterioration in the patient's self-concept | Regarding the postoperative changes, the objective is to provide information that will enable the patient to participate in self-care | The objective is to facilitate relaxation in the patient by providing information that will assist them in accepting their body image | It is imperative that one does not love oneself or one's body. Instead, one must embrace self-acceptance |
| The extent to which he experiences fear in the future will depend on the nature of the surgical procedure he has undergone | Following discharge from the hospital, it is important to facilitate the individual's ability to adapt to the changes that will inevitably occur. This process should enable the individual to express their fears | Lifestyle modifications are employed to address the patient's concerns and alleviate their fears | The utilisation of coping strategies |
| Currently residing in a situation that is the result of a surgical condition. This situation is characterised by general adjustment problems and ineffective coping strategies | In order to address the challenges encountered in the adaptation process, it is essential to provide training | The process of adaptation is facilitated by the provision of support to the patient, which in turn alleviates the discomfort associated with the procedure | In terms of coping strategies, it is advisable to cultivate self-belief and avoid placing undue trust in others |
| **Environmental** | | | |
| The hospital environment is a significant factor in determining sleep patterns | The identification of environmental factors that may precipitate insomnia is a crucial aspect of the treatment plan. Limiting the number of visitors to the patient is also an important consideration. The provision of a calm, dim, and quiet room is essential for the patient's well-being. It is also vital to ensure that the door to the room remains closed at all times | The patient is in bed and requires information that will enable them to return to a state of relaxation. This can be achieved by switching to the old sleep pattern | The maintenance of habitual sleep patterns |
| **Sociocultural** | | | |
| The phenomenon of social isolation can be attributed to a number of factors, including the separation from family, trusted and loved ones, and the presence of unfamiliar and unfamiliar individuals | The surgical procedure will fulfil its intended role and will not present an obstacle to the provision of information about the meeting with siblings and friends, as well as the provisioning | In order to facilitate the operation, it is essential to gain the support of the parents. This can be achieved by organising social activities and reassuring the patient by informing them that the situation is temporary and that it will not be an obstacle | The child's family and friends provide support and information, as well as recognition. The child's physical, cognitive, emotional and social development are also important considerations |

### 3-Environmental Dimension

The patient was diagnosed with sleep disturbance due to the combined effects of postoperative pain, general hospitalisation, and frequent follow-up and treatment hours. Monitoring, treatment and care were provided in a manner that sought to minimise the impact on sleep patterns. The patient's treatment plan was revised. The patient was kept awake during the day and provided with a comfortable night's sleep.

### 4-Socio-Cultural Dimension

It was observed that the patient exhibited social isolation problems as a consequence of the separation from her siblings and close friends and the unfamiliar environment in which she found herself. The patient was informed that the surgical site would heal and that it would not affect her social activities in the future. The patient's needs were identified with the input of the parents and the patient was enabled to participate in physical, cognitive, emotional and social activities.

## DISCUSSION

The score that can be obtained from the scale can vary between 48-192. The obtained score is divided by the number of items of the scale, i.e. 48, to determine the comfort level ranging between a maximum score of 4 and a minimum score of 1.1

According to Kolcaba's Comfort Theory, the evaluation of comfort levels after postoperative care is provided is important

to demonstrate the effectiveness of the theory.[2] During the patient's preoperative clinical presentation, the comfort level was measured as low as 1.58 on the General Comfort Scale (GCS). It was noticed that the patient's comfort level was low before the operation and she had adjustment problems. On the 1st postoperative day, the comfort level was 1.50 4 hours after waking up from anaesthesia and before applying care within the framework of the comfort theory, while it was determined as 2.7 after starting to apply care within the framework of the comfort theory on the same day (at the 8th hour). On the 3rd postoperative day; this assessment, which is made in the first acute recovery process, is used to observe the effectiveness of the interventions made on the first day and the changes in the patient's comfort, and the scale result was determined as 3.0. The 7th postoperative day is used to determine the progress in the patient's recovery process, the effectiveness of pain management and the general comfort level of the patient, and the scale result was 3.2. This time period is especially critical for discharge planning and home care requirements.

In the study of Hughes and Whittemore (2021), the effect of nursing interventions based on Kolcaba's Comfort Theory on the comfort levels of surgical patients was examined. The comfort levels of the patients were evaluated on the first and third postoperative days. The results of the study show that Kolcaba's Comfort Theory is effective in increasing the comfort levels of patients and improving postoperative recovery processes when used in surgical nursing practices.[9]

In a randomised controlled study in which Aslan and Ünal (2020) evaluated the preoperative and postoperative comfort levels of surgical patients with nursing care interventions based on Kolcaba's Comfort Theory, comfort levels were measured one day before surgery and on the first, third and seventh days after surgery. It shows that nursing interventions based on Kolcaba's Comfort Theory have positive effects on the comfort and anxiety levels of surgical patients.[10]

In Salem and Salem (2020) study, the effect of nursing care based on Kolcaba's Comfort Theory on the comfort levels of surgical patients in the postoperative period was evaluated. Measurements were made on the first, third and seventh days after surgery. It shows that Kolcaba's Comfort Theory can be used effectively in the postoperative care of surgical patients and can increase the comfort levels of patients.[11] Our study supports the results of the literature. In addition, the effectiveness of the theory was tested by looking at the comfort measurements before and after the theory-based nursing intervention on the 1st postoperative day. Comfort theory supports the physical and psychological well-being of patients and helps them recover faster and shorten their hospital stay.[10] In addition, increasing patient satisfaction and decreasing complication rates offer important results in terms of improving the quality of care.

## CONCLUSION

Consequently, the care plan for the patient who underwent salpingo-oophorectomy surgery due to an ovarian tumour was organised in accordance with Kolcaba's Comfort Theory, and it was demonstrated that it was applicable in the field. It was demonstrated that an increase in comfort was achieved by adopting behaviours to improve well-being with the care provided according to the comfort theory.[7,8] Based on the comfort theory developed by Kolcaba, nursing care can be shaped according to individual needs after nursing interventions to increase the comfort of the patient who has undergone surgical procedure.[9,10,11] In this way, it is possible to contribute to the quality of life by providing the highest level of comfort to patients. It is thought that the use of comfort theory will be useful in seeing and responding to patient needs in a more systematic way.

## ETHICAL DECLARATIONS

### Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients.

### Referee Evaluation Process

Externally peer-reviewed.

### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

### Financial Disclosure

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### Author Contributions

Authorship Contributions: Authorship Contributions: Concept: D.E., E.A.P., E.I.; Design: D.E., E.A.P., E.I.; Supervision: D.E., E.A.P., E.I.; Resources: D.E., E.A.P., E.İ.; Data Collection or Processing: D.E., E.A.P., E.İ.; Analysis or Interpretation: D.E., E.A.P., E.İ.; Literature Search: D.E., E.A.P., E.İ.; Writing: D.E., E.A.P., E.İ.; Critical Appraisal: D.E., E.A.P., E.İ.

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MHA MEDIHEALTH ACADEMY

Surgery on Children

Letter to Editor

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# A student's perspective on surgical specialty education in Turkiye

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Dear Editor,

Pediatric Surgery is defined as the diagnostic, operative, and postoperative surgical care of children with developmental, inflammatory, neoplastic, traumatic congenital, and acquired anomalies and diseases. A pediatric surgeon can perform many surgeries such as; appendectomy, colectomy, cholecystectomy, splenic splenectomy, inguinal and umbilical hernia, pectus excavatum treatment. Subspecialties of pediatric surgery mainly include: neonatal surgery and fetal surgery, some of the pediatric cardiothoracic procedures, pediatric nephrological surgery, pediatric neurosurgery, and some procedures that may be related to pediatric urological surgery (surgery related to the child's kidneys and ureters, including kidney or kidney transplantation, surgery of the child's urinary bladder and other structures and the lower part of the kidney required for ejaculation), pediatric emergency surgery, surgery involving fetuses or embryos (overlapping with obstetric/gynecological surgery, neonatology, and maternal-fetal medicine), surgery involving adolescents or young adults, pediatric hepatological (liver) and gastrointestinal (stomach) surgery (including liver and intestinal transplantation in children), some pediatric orthopedic surgeries, pediatric plastic and reconstructive surgery, and pediatric oncological (childhood cancer) surgery.

Although all these subunits in Turkiye and almost all surgical techniques can be applied, Pediatric Surgery is among the least preferred departments today. One of the problems that causes this outcome may be the increasing number of malpractice lawsuits in the pediatric patient group, just like in the gynecology and obstetrics group. Also, parents who threatened medical personnel with lawsuit demonstrated contradictory behaviours such as expecting doctors all the required energy to calm their child. Disregarding the difficulties caused by families who bring their children to outpatient clinics , there are also obstacles observed by the students receiving training. Another factor not to prefer pediatric surgery may be about self-comfort. Some medical students, like some other people, want to work less and earn more money. Problems such as these, may be more others, constitute why the staff in many surgical branches, especially pediatric surgery, is gradually decreasing. In addition, 10 to 20 years ago, medical school students who passed the examination to be a resident (TUS) were voluntarily enrolling in surgery branches because it offered both professional satisfaction and a financially appropriate quality of life. However, nowadays, the decrease in the scores of surgical branches due to the reasons mentioned above suggests that, unfortunately, students who score enough to pass the threshold in TUS see these branches as an escape route to avoid practicing. As a result of this situation, low-ranking students in TUS choose surgical branches that require more qualification. Sorrowfully, these types of residents faced with a 6-year basic education deficiency and forthcoming 5-year abrasive specialization curriculum that lead many assistant physicians to resign. If all these compelling period is, somehow, passed in that case as an consequence of mediocre training and education, more complicated situation likes life endangering, mismanagement of clinical situations, misdiagnosis problems, wrong medical and surgical treatments, might further affects the patient-physician relationships, which are very prone to abuse.

As a solution; To eliminate the shortage of specialist doctors and to make pediatric surgery and other surgical branches attractive, volunteer medical students can be taught simple surgical procedures/applications (sutures, dressings, surgery videos, etc.) at an early stage of their education, and these students can also be supported academically.

According to an article conducted to evaluate purpose, it is aimed to expand medical students' access to clinical learning, resources, and opportunities, regardless of city. The overall theme revolved around how the project allowed them to explore surgery earlier in their medical education and how the project helped them consider surgery as a career.[1] The operating room and camera system were used for the developed project. One of surgery's main goals was to foster an early interest in surgical disciplines among students by encouraging early participation in preclinical education. In addition, the project aimed to assess how much students valued their experiences in learning in the clinic, meeting people with surgical careers, and developing the skill sets necessary to create learning resources. Survey results found that 87.5% of student expressed satisfaction with the enhanced clinical experience, particularly

acknowledging that for many medical students. This was their first experience in the operating room. All students either "agreed" or "strongly agreed" that the project provided them with valuable leadership experience, practical skills in creating educational learning resources, and opportunities to explore careers in surgery. All the students, either "agreed" or "strongly agreed", emphasized that the project allowed them to gain valuable skills in educational video production, including video shooting and video editing. Written feedback from students participating in the survey was mostly positive.

According to the conclusion drawn from this article, the use of plenty of visuals (video, photographs, live broadcasts from the operating room / having students watch previous surgical broadcasts) during surgical training and warming up students to the procedures at an early age will positively affect medical faculty students' choice of surgery branch in the future.

## ETHICAL DECLARATIONS

### Referee Evaluation Process

Externally peer-reviewed.

### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

### Financial Disclosure

The authors declared that this study has received no financial support.

### Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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