


Nursing process in neonate with delay in the surgical recovery for duodenal atresia


Proceso enfermero en neonato con retraso en la recuperación quirúrgica por atresia duodenal

Processo de enfermagem do neonato com atraso na recuperação cirúrgica por atresia duodenal


Itzel Andrea Sánchez-Juárez¹

 <https://orcid.org/0000-0003-2979-0416>


María Luz de Avila-Arroyo^{2*}

 <https://orcid.org/0000-0003-4924-1959>

Inés Tenahua-Quitl³

 <https://orcid.org/0000-0002-3987-8254>

Alejandro Torres-Reyes⁴

 <https://orcid.org/0000-0001-5133-4172>

1. Bachelor's Degree in Nursing. Benemérita Universidad Autónoma de Puebla, Nursing School. Puebla, Mexico.
2. Master in Nursing Sciences. Benemérita Universidad Autónoma de Puebla, Nursing School. Puebla, Mexico.
3. Master in Nursing Sciences. Benemérita Universidad Autónoma de Puebla, Nursing School. Puebla, Mexico.
4. Master in Nursing. Benemérita Universidad Autónoma de Puebla, Nursing School. Puebla, Mexico.

*Correspondence author: maluz_deavila@hotmail.com

Received: 05/03/2020

Accepted: 18/01/2021

Abstract

Introduction: Duodenal atresia is a congenital malformation where a functional or anatomic abnormality causes normal intestinal motility's disorders. The definitive treatment includes a surgical repair, whose main goal is to recover the intestinal continuity. Neonates treated with this kind of procedures have a high morbidity associated to surgical complications, sepsis, and dehiscence of surgical wound. **Objective:** Implement the nursing process by using the NANDA, NOC, NIC, and GPC taxonomies in order to contribute to the management of the newborn with delayed

surgical recovery from duodenal atresia. **Methodology:** It was addressed through a case study in which the stages of the nursing process were implemented; the assessment was done by patterns functional health of Marjory Gordon, the altered patterns were prioritized and diagnosis labels were identified. **Case presentation:** 22-day old neonate extrauterine, was born from 38.5 SDG in a public hospital, post operated on intestinal plasty; the neonate had a dehiscence and infected surgical wound. The neonate showed signs of acute pain and gastrointestinal motility complications such as bloating and gastric residue. Auxiliary diagnosis results showed thrombocytopenia and increased C reactive protein. **Conclusion:** The hierarchical organization of the affected functional patterns allowed executing a care plan and taking care of the needs of the neonate, all of that through interventions sustained on scientific evidence.

Key words: Nursing process; newborn; congenital abnormalities; intestinal atresia; surgical wound; acute pain (DeCS) (DeCS).

Resumen

Introducción: La atresia duodenal, es una malformación congénita donde una anomalía anatómica o funcional ocasiona la falla del tránsito intestinal normal. El tratamiento de elección es la reparación quirúrgica, que tiene como objetivo restablecer la continuidad intestinal. Los neonatos sometidos a este tipo de procedimientos tienen alta morbilidad asociada a complicaciones quirúrgicas, sepsis y dehiscencia de herida quirúrgica. **Objetivo:** Implementar el proceso enfermero mediante el uso de las Taxonomías NANDA, NOC, NIC y GPC para contribuir al manejo del neonato con retraso en la recuperación quirúrgica por atresia duodenal. **Metodología:** Se abordó a través de un estudio de caso en el que se implementaron las etapas del proceso enfermero, la valoración se realizó por patrones funcionales de salud de Marjory Gordon, se priorizaron los patrones alterados e identificaron etiquetas diagnósticas. **Presentación del caso:** Neonato de 22 días de vida extrauterina, nació de 38.5 SDG de un hospital público, post-operada de plastia intestinal, tenía una herida quirúrgica dehisciente e infectada. Presentó signos de dolor agudo y complicaciones en la motilidad gastrointestinal como distensión abdominal y residuo gástrico. Los resultados auxiliares de diagnóstico mostraron trombocitopenia y aumento de la proteína C reactiva. **Conclusión:** La jerarquización de los patrones funcionales afectados, permitió realizar la ejecución de un plan de cuidados y atender las respuestas humanas que el neonato presentó, a través de intervenciones sustentadas en evidencia científica.

Palabras clave: Proceso de enfermería; Recién nacido; Anomalías congénitas; Atresia intestinal; Herida quirúrgica; Dolor agudo (DeCS).

Abstrato

Introdução: A atresia duodenal é uma malformação congênita onde uma anomalia de anatômica ou funcional causa a falha do trânsito intestinal normal. O tratamento de escolha é o reparo cirúrgico, que visa restaurar a continuidade intestinal. Os recém-nascidos submetidos a esse tipo de procedimento apresentam alta morbidade associada a complicações cirúrgicas, sepse e deiscência da ferida cirúrgica. **Objetivo:** Implementar o processo de enfermagem mediante o uso das Taxonomias NANDA, NOC, NIC e GPC que contribua a o manejo do recém-nascido com atraso na recuperação cirúrgica por atresia duodenal. **Metodologia:** Foi abordada por meio de um estudo de caso no qual o



processo de enfermagem foi aplicado, a avaliação foi realizada pelos padrões funcionais de saúde de Marjory Gordon, foram priorizados os padrões alterados e foram identificadas as etiquetas de diagnóstico. **Apresentação do caso:** Neonato de 22 dias de vida extra-uterina, nasceu de 38.5 SDG de um hospital público, pós-operatória de plastia intestinal, tinha uma ferida cirúrgica deiscente e infetada. Apresentou sinais de dor aguda e complicações na motilidade gastrointestinal como a distensão abdominal e resíduo gástrico. Os resultados do diagnóstico auxiliar mostraram trombocitopenia e aumento da proteína C reativa. **Conclusão:** A hierarquia dos padrões funcionais afetados, permitiu realizar a execução de um plano de cuidados e atender às respostas humanas que o neonato apresentou, através de intervenções baseadas em evidências científicas.

Palavras-chave: Processo de enfermagem; Recém-nascido; Anormalidades congênicas; Atresia intestinal; Ferida cirúrgica; Dor aguda (DeCS).

Introduction

The World Health Organization (WHO) defines congenital malformations as structural or functional anomalies that occur during intrauterine life and are detected during pregnancy, delivery or after birth ⁽¹⁾. In Mexico, 59.8% of deaths in the neonatal period are represented by some congenital malformation, among which is the atresia of the small intestine that occurs in some portion of it, it is a rare pathology, which in 2017 occurred in 46 cases of live births ⁽²⁾.

Atresia, which causes failure of normal intestinal transit, has a prevalence of 1 per 5,000 to 10,000 live births ^(3,4). Several studies show that about one third of the cases are associated with Down syndrome or trisomy 21 ⁽⁴⁻⁶⁾. The diagnosis can be made early by means of prenatal ultrasound, from the 20th week of gestation, where dilatation of the stomach and the proximal portion of the duodenum will be observed, which produces the characteristic sign of the "double bubble", as well as the presence of polyhydramnios; after birth, the definitive diagnosis is made by means of a simple abdominal radiography ^(3,5,7).

Neonates with duodenal atresia present vomiting during the first hours after birth, and the characteristics of this will depend on the location of the obstruction with respect to the ampulla of Vater; when it is above, gastric content will be observed in the vomit, if the obstruction is below, there will be loss of bile and pancreatic juice; another clinical sign is abdominal distention due to the accumulation of liquids and gases in the portion close to the obstruction ⁽³⁾. The treatment of choice is surgical repair, which has the objective of reestablishing intestinal continuity to allow



feeding, by means of an open duodenoduodenostomy, in the form of a diamond or Kimura operation; however, neonates submitted to this type of procedure have high morbidity associated mainly to surgical complications, sepsis and surgical wound dehiscence ^(3,5).

In relation to the above, no evidence was found where the Nursing Process (NP) was applied to this specific pathology; however, research was found in which esophageal atresia in neonates was studied and the main nursing diagnoses that stand out are ineffective feeding, altered nutrition, risk of infection and altered sleep pattern. Likewise, both cases used pain assessment with the CRIES scale (Crying, requires oxygen to maintain saturation > 95%, increased vital signs, expression, sleepiness), and acute pain was pointed out, focusing interventions on non-pharmacological measures ^(8,9).

The aforementioned evidences the importance of unifying care criteria for neonates in the postoperative period of the gastrointestinal tract with delayed surgical recovery, given that complications compromise their health status. In this sense, the nursing professional has the NP, a method of intervention that favors independent practice and quality of care ⁽¹⁰⁾. Therefore, the objective arises: to implement the NP through the use of NANDA, NOC, NIC and GPC Taxonomies in order to contribute to the management of the neonate with delayed surgical recovery due to duodenal atresia.

Methodology

A neonate was approached through a case study in which the NP was applied in its five stages of assessment, diagnosis, planning, execution, and evaluation in the neonatal intensive care unit (NICU) of a high-specialty hospital in the state of Puebla, Mexico. It was based on Marjory Gordon's functional health patterns assessment framework ⁽¹¹⁾, which was complemented with physical examination. The validation of the data was by reevaluation of the patient, the participation of other nursing professionals to confirm them and thus arrive at the use of the taxonomies of NANDA International, Inc⁽¹²⁾ preparing the nursing diagnoses.

Subsequently, the desired results that express the patient's condition, behavior or perception were established with the classification of nursing outcomes (NOC) ⁽¹³⁾, from which the classification of nursing interventions (NIC) ⁽¹⁴⁾



and recommendations of Clinical Practice Guidelines (CPG) ⁽¹⁵⁻¹⁶⁾ were determined. In obtaining the data, the confidentiality of the information was assured with the informed consent that was given to the parents of the neonate, as well as dignified and respectful treatment.

Case Presentation

Background

This is a female neonate, who for the purposes of this study is named AMG. When the evaluation began, she was 22 days old, in the NICU's incubator, with the following medical diagnoses: post-operated intestinal plasty (duodenum-duodenum anastomosis Kimura type; 17 days) for duodenal atresia, dehiscence and infection of the surgical wound, cholestatic syndrome and Down's syndrome. According to the family history, no chronic degenerative or congenital diseases are reported in the family.

Born at 38.3 weeks of gestation by Capurro test via the abdominal route, product of the third gestation of her 35-year-old mother, with a bachelor's degree, teacher, and with adequate prenatal control; her 32-year-old father studied up to high school and was working in the maintenance sector; the couple had two children, one 11 years old and one 4 years old. They are Catholic and were originally from the state of Tlaxcala but reside in Puebla.

Marjory Gordon Functional Health Pattern Assessment

A general assessment (February 17, 2018) and a focused assessment (February 18, 2018) were carried out. In the first one, global data on human responses were collected to determine the elements that represented some alteration and from this, the second one was carried out, where the alterations considered as a priority when determining the health status of the newborn were deepened. Subsequently, an assessment of the objective and subjective data was made, determining the dysfunctional patterns, which are described below.

Nutritional-metabolic pattern: AMG anthropometry indicators recorded weight 3,500 grams, height 54 cm, thoracic perimeter 34.5 cm, and abdominal perimeter 35.5 cm. He presented the following variations in the capillary blood glucose results: at 8 hours 48 mg/dl, at 14 hours 56 mg/dl and at 20 hours 61 mg/dl. He was maintained on



Total Parenteral Nutrition of 72.8 kcal/kg/day with continuous infusion of 15 ml/hour intravenously through a Peripherally Inserted Central Venous Catheter (PICC). In addition, 2 ml of formula was started by enteral route through a 5 French (Fr) caliber orogastric tube (OG) for every three hours; however, after that, she presented abdominal distension and a residue of 2 ml of gastric content before the second intake, so fasting was indicated, removal of this tube and placement of a larger caliber tube (8 Fr) to leave it for derivation; based on the above, a biliary characteristics expenditure of 5 ml in 6 hours was obtained.

AMG's skin showed icteric staining, the oral mucosa was hydrated, she had small mouth and macroglossia which caused a weak sucking reflex; she also had difficulty in the regulation of body temperature which ranged between 36.7°C and 37.5°C. In the mesogastrium, she had a dehiscence surgical wound, oval, approximately 3 cm long by 1 cm wide, with fibrin formation and diffuse borders; a 1 cm excavation located at 9 to 12 o'clock, and the presence of exudate in moderate quantity, foul-smelling, greenish color; The perilesional skin of the wound was erythematous, and was covered with a dressing of polyhexamethylene biguanide (PHMB) and micropore, which served to assess the expense of the same. She presented edema in the left pelvic limb apparently due to the presence of the PICC, which at the time of the assessment was 15 days old since its installation; its healing had been performed the day before the assessment.

Elimination pattern: urine output was 4 ml/kg/hour, collected from nine measurements, with dark yellow urine, she had two bowel movements with green semi-pasty stools; she showed distention and visible venous network in the abdomen, on auscultation intestinal peristalsis was decreased and there was constant flatulence before bowel movements. She had frequent sweating after periods of irritability and prolonged crying.

Activity-exercise pattern: the vital signs reported at the time of assessment were: heart rate 143 bpm, respiratory rate 68 rpm, temperature 37.5°C, partial oxygen saturation (SpO₂) 97% and distal capillary filling of 3 seconds. She was on stage I ventilation with cephalic helmet and humidifier with inspired fraction of oxygen (FiO₂) at 50%. AMG was awake and active with constant movements, irritable to manipulation to the point of crying.

Sleep-rest pattern: AMG does not achieve long periods of sleep, these lasting approximately one hour.



Cognitive-perceptual pattern: according to the modified Glasgow Scale for infants, an alert state of consciousness (14/15) was identified; she presented signs of pain on palpation and manipulation in the abdominal area with a level 6 according to the CRIES scale, with inconsolable high-pitched crying, requirement of $\text{FiO}_2 > 30\%$ oxygen, facial expression with grimaces, waking up at frequent intervals.

The assessment was continuous and, four days after the first one, the patient was identified as having restarted OV feeding by OG, after the administration of three separate intakes in three-hour intervals, she presented vomiting of biliary characteristics, so she was left fasting again.

As for the assessment of the surgical wound, it showed a size of 3 cm in length by 1 cm in width, with presence of granular tissue, undermining of 1 cm was found from 9 to 12 o'clock clock, scarce greenish non-fetid exudate and surrounding skin erythema in decrease; a PHMB dressing was used again which was covered with microporous adhesive tape. Diagnostic ancillary findings: blood cytometry showed thrombocytopenia ($6.0 \cdot 10^3/\text{l}$) and leukocytosis ($4.0 \cdot 10^3/\mu\text{l}$), C-reactive protein (CRP) values were elevated (94.7 mg/l). Peripheral blood culture performed on February 19 revealed the growth of Gram (+) bacteria and probable contamination by *Staphylococcus aureus*, data that suggest the diagnosis of neonatal sepsis ⁽¹⁶⁾.

After identifying the altered patterns through the assessment, a clinical judgment was established through critical reasoning, formulating nursing diagnoses according to the neonate's condition (12). Based on this, the nursing interventions were selected by categorizing them according to the human needs of Maslow and Kalish in order to achieve the expected results to avoid, reduce or correct the altered responses in the neonate through the preparation and implementation of the interventions to subsequently evaluate the stages of the NP ⁽¹⁷⁾ (table 1).



Table 1. Nursing care plan for the AMG neonate.

Nursing diagnosis (NANDA) ⁽¹²⁾	Expected Results (NOC) ⁽¹³⁾	Interventions	Execution and Evaluation
<p>Acute pain related to biological agents (infection) as evidenced by expressive behavior (restlessness, irritability, crying), and evidence by standardized pain testing: CRIES level 6 scale: crying with high-pitched inconsolable tone, FIO₂>30% oxygen requirement, grimacing facial expression, awakening at frequent intervals.</p>	<p><i>Pain level.</i> Indicators: - Duration of pain episodes - Restlessness - Irritability - Grimacing - Tears <i>Nivel del dolor.</i></p>	<p>Pain management: intense ⁽¹⁴⁾</p> <ul style="list-style-type: none"> • Perform a comprehensive assessment of pain including location, onset, duration, frequency and intensity, as well as factors that relieve and aggravate pain. • Monitor pain using a valid and reliable age-appropriate measurement tool. <p>GPC SS-745-15 ⁽¹⁵⁾</p> <ul style="list-style-type: none"> • Control environmental factors that may influence the neonate's response to discomfort. • Encourage adequate sleep periods to facilitate pain relief. • Perform pain assessment before and after painful clinical procedures. • Pain assessment with the CRIES scale is suggested every two hours in order to continue or withdraw the prescribed treatment. 	<p>Pain was monitored using the CRIES scale every two hours. For pain control, pharmacological measures were used, such as the administration of IV paracetamol; and non-pharmacological measures, such as avoiding excessive noise, covering the incubator from ambient light and the use of non-nutritive suction, mainly during surgical wound healing and punctures to monitor capillary glucose. In addition, the sleep/wake cycle was respected and interventions were scheduled in order to avoid repeated stimuli. The evaluation showed a decrease in crying, a score of 5 (moderate pain) on the CRIES scale was achieved.</p>
<p>Dysfunctional gastrointestinal motility related to changes in eating habits and stressors as evidenced by distended abdomen, increased gastric residue, bilious colored gastric residue, vomiting.</p> <p><i>Associated conditions:</i> food intolerance and enteral feeding.</p>	<p><i>Gastrointestinal function.</i> Indicators: • Food tolerance • Amount of residue in aspirated gastric contents o • Color of aspirated gastric contents • Abdominal distention • Vomiting</p>	<p>Gastrointestinal catheter care ⁽¹⁴⁾</p> <ul style="list-style-type: none"> • Observe the correct placement of the tube and fix the tube to the corresponding body part. • Periodically monitor water and electrolyte status. • Monitor the amount, color and consistency of gastric contents. • Provide care of the nose and mouth 3 to 4 times a day or as needed and care of the surrounding skin. 	<p>The material was prepared for the repositioning of the OG, an 8 Fr caliber was used and after placement, it was verified that AMG did not show signs of asphyxia. The OG was fixed on the cheeks and left to shunt with a collection bag. The characteristics of the OG output were recorded. Oral cavity cleansing was performed in a gentle manner every four hours. At the end of the shift, fluid control was carried out, in which a positive balance was obtained (+153 ml).</p>



Continue table 1....

		<p>Enteral tube feeding ⁽¹⁴⁾</p> <ul style="list-style-type: none"> • Before each intermittent feeding, check for residues. • Observe for the presence of bowel sounds every 4-8 hours. • Control fluid intake/excretion. • Weighing of the newborn daily. 	
<p>Delayed surgical recovery related to pain, as evidenced by interrupted surgical wound healing (dehiscence and infection), excessive time required for recovery.</p> <p><i>Associated condition:</i> Surgical site edema, perioperative surgical site infection, extensive surgical procedure (Kimura type duodenal plasty).</p>	<p><i>Wound healing: by second intention.</i></p> <p>Indicators:</p> <ul style="list-style-type: none"> • Surrounding cutaneous erythema • Purulent secretion • Excavation • Wound inflammation • Wound smell • Wound size decrease • Granulation 	<p>Wound care ⁽¹⁴⁾</p> <ul style="list-style-type: none"> • Monitor wound characteristics, including drainage, color, size and smell. • Change the dressing according to the amount of exudate and drainage. • Measure the wound base. <p>GPC SS-745-15 ⁽¹⁵⁾</p> <ul style="list-style-type: none"> • Record once a week the characteristics of the wound and the exudate. • Evaluate consistency, color, smell and quantity of the exudate, this allows the healing process to be assessed. • Use physiological solution or distilled water at a neutral temperature (37°C) to clean the perilesional skin to promote proper enzymatic activity, cellular function and metabolism. • To exert a washing pressure that guarantees the removal of detritus, bacteria and material from previous cures, without damaging healthy tissue. • Use antimicrobial dressings to help reduce pain and smell when progression to infection or disruption of healing is suspected. 	<p>During the first assessment of AMG, surgical wound healing was performed, where the necessary barrier measures were used; the wound was cleaned with injectable water at room temperature and its characteristics were identified; a dressing with PHMB was placed and covered with micropore. One week later, the same healing procedure was carried out, where the presence of granulation tissue was observed, and the surrounding cutaneous erythema decreased, the quantity and smell of exudate decreased, however, no significant changes were detected in the excavation and dimensions of the wound.</p>



<i>Continue table 1....</i>	<i>Severity of infection: newborn.</i>	Infection control ⁽¹⁴⁾	All contact precautions required by the newborn were carried out, such as being in an isolated room, performing hand hygiene during the five moments. The axillary temperature was monitored every two hours, presenting increases in the thermal curve, so, as a non-pharmacological measure, the incubator hood was opened until the newborn's temperature decreased. Vancomycin 46 mg was administered every 8 hours, meropenem 62 mg every 12 hours, amikacin 65 mg every 12 hours and fluconazole 21 mg every 12 hours IV
	Indicators:	<ul style="list-style-type: none"> • Maintain proper isolation techniques and universal precautions. 	
	<ul style="list-style-type: none"> • Temperature instability • Increased leukocytes Foul-smelling discharge • Purulent drainage Irritability 	<ul style="list-style-type: none"> • Limit the number of visitors and request that they wash their hands when entering and leaving the room. Ensure aseptic handling of all intravenous lines. 	
		Temperature control ⁽¹⁴⁾	
		<ul style="list-style-type: none"> • Monitor the neonate's temperature at least every 2 hours and observe it until it stabilizes. 	
		<ul style="list-style-type: none"> • Observe skin color and temperature. 	
		<ul style="list-style-type: none"> • Adjust the room temperature to the needs of the newborn. 	
		GPC SS-283-12 ⁽¹⁶⁾	
		<ul style="list-style-type: none"> • Parenteral nutritional support. 	

Source: NANDA ⁽¹²⁾, NOC ⁽¹³⁾, NIC ⁽¹⁴⁾, GPC SS-745-15 ⁽¹⁵⁾; own development.

Discussion

The NP guarantees the systematization of care to cover the needs resulting from human responses. Taking into account the nursing diagnoses obtained from this study, the use of the CRIES scale was evidenced, as did Lara and Montero ^(8,9), who from this determined the diagnostic label of acute pain. This can be manifested because the neonates with atresia were submitted to surgical procedures that cause pain; the scale identifies physiological and behavioral parameters before the constant painful stimuli who the newborns experience and cannot be obtained verbally, so the use of the scale allowed to evaluate it, as well as to attend to the recommendation of the GPC SS-745-15 ⁽¹⁵⁾.

Additionally, in this study a diagnosis of dysfunctional gastrointestinal motility was found, which does not agree with other authors who established ineffective feeding and altered nutrition ^(8,9); however, these findings could be related since both attend the needs of the gastrointestinal tract which, being altered, prevents the ingestion,



digestion, and absorption of nutrients, and the interventions are focused on maintaining the nutritional status through enteral and parenteral feeding to promote recovery.

Conclusions

In this study, the NP was implemented, establishing as diagnosis severe pain, dysfunctional gastrointestinal motility, and delayed surgical recovery. Subsequent to the execution of the care plan, it was evidenced that the expected results showed a change from substantially to moderately compromised. The use of the CRIES scale to assess pain in the newborn is suggested. Carrying out interventions based on scientific evidence through the NP provides the nursing personnel with the use of standardized language to carry out the care of the newborn with slow surgical recovery due to duodenal atresia, as well as individualized and timely care to improve well-being.

Conflict of interests

There is no conflict of interest between the authors.

Financing

Authors' own funding.

Bibliographic References

1. Organización Mundial de la Salud (OMS). Nota descriptiva de anomalías congénitas [Internet] 2016 [actualizado 7 septiembre de 2016; consultado 20 de diciembre de 2018]. Available at: <http://www.who.int/es/news-room/fact-sheets/detail/congenital-anomalies>
2. Navarrete E, Canún S, Valdés J, Reyes A. Malformaciones congénitas al nacimiento: México 2008-2013. Bol MedHospInfant Mex. [Internet] 2017 [consultado: 16 de diciembre de 2018];74(4): 301-8. Available at: <https://doi.org/10.1016/j.bmhmx.2017.02.003>
3. Gil M, Miguel M, Rosas M. Síndrome de obstrucción intestinal neonatal. Revista Mexicana de Atención Primaria a la Salud. [Internet] 2016 [consultado: 8 de enero de 2019];4:18-21. Available at: <https://bit.ly/3gTKEJA>
4. Miscia M, Lauriti G, Lelli P, Zani A. Duodenal atresia and associated intestinal atresia: a cohort study and review of the literature. PediatrSurgInt. [Internet] 2018 [consultado: 29 de enero de 2019]; 35(1): 151-7. Available at: <https://doi.org/10.1007/s00383-018-4387-1>



5. Chiarenza S, Bucci V, Conighi M, Zolpi E, Costa L, Fasoli L, Blevé C. Duodenal atresia: open versus mis repair - analysis of our experience over the last 12 years. *BioMed Res Int*. [Internet] 2017 [consultado: 29 de enero de 2019]; 1-7. Disponible: <https://doi.org/10.1155/2017/4585360>
6. Siu A, Paredes R, Betancourth J, Vázquez F, Delgado L, Garrido J. Análisis retrospectivo de la morbilidad y mortalidad de las atresias intestinales diagnosticadas en el periodo neonatal. *CirPediatri*. [Internet]. 2018 [consultado: 17 de enero de 2019]; 31(2): 85-9. Available at: <https://bit.ly/2XY9Jfb>
7. Ormaechea M, Berazategui R. Membrana duodenal: a propósito de un caso. *AnFaMed*, Universidad República de Uruguay. [Internet] 2017 [consultado: 20 de enero de 2019]; 4(2): 47-57. Available at: <https://doi.org/10.25184/anfamed2017v4n2a7>
8. Lara D. Intervenciones especializadas en las necesidades básicas de un neonato a término con atresia esofágica. [Tesis de especialidad]. México: Universidad Nacional Autónoma de México; 2017 [consultado: 19 de enero de 2019]. Available at: <http://132.248.9.195/ptd2017/octubre/0766799/Index.html>
9. Montero W. Estudio de caso: recién nacido con alteración en la necesidad de alimentación por atresia de esófago grado III. [Tesis de especialidad]. México: Universidad Nacional Autónoma de México; 2017 [consultado: 18 de enero de 2019]. Available at: <http://132.248.9.195/ptd2017/junio/0760201/Index.html>
10. Mondragón I, Sosa M. Experiencias de los alumnos en el aprendizaje del proceso de atención de enfermería. *Enferm Univ*. [Internet] 2019 [consultado: 7 de febrero 2019]; 16(3): 249-58. Available at: <https://doi.org/10.22201/eneo.23958421e.2019.3.709>
11. Gordon M. Diagnóstico enfermero. Proceso y Aplicación. 3ra ed. Madrid, España: Harcourt Brace; 1999.
12. Herdman TH, Kamitsuru S. NANDA Internacional, Inc. Diagnósticos enfermeros. Definiciones y clasificación 2018-2020. Edición hispanoamericana. 11 ed. España: Elsevier; 2019.
13. Moorhead S, Johnson M, Swazon E, Maas M. Clasificación de resultados de enfermería (NOC). 6a ed. Barcelona España: Elsevier-Mosby; 2018.
14. Butcher H, Bulechek G, Docheterman J, Wagner C. Clasificación de Intervenciones de Enfermería (NIC). 7a ed. Barcelona España: Elsevier; 2018.
15. Secretaría de Salud (SS). Guía de práctica clínica manejo integral de heridas de alta complejidad en el paciente pediátrico en los tres niveles de atención a la salud (GPC SS-745-15). [Internet] 2015 [consultado: 17 de diciembre de 2018]. Available at: <https://n9.cl/3u2d>
16. Secretaría de Salud (SS). Guía de práctica clínica prevención, diagnóstico y tratamiento de sepsis y choque séptico del recién nacido en el segundo y tercer nivel de atención (SS-283-12). [Internet] 2012 [consultado: 16 de diciembre de 2018]. Available at: <https://n9.cl/fwj7>



17. Alfaro R. Pensamiento crítico y juicio clínico en enfermería. un enfoque práctico para un pensamiento centrado en los resultados. 4ª. Ed. España: Elsevier; 2009.

How to cite this article: Sánchez-Juárez IA, De Avila-Arroyo ML, Tenahua-Quitl I, Torres-Reyes A. Nursing process in neonate with delayed surgical recovery for duodenal atresia. SANUS [Internet]. 2021 [cited yy mm dd]; 6: e189. Available from: <https://doi.org/10.36789/sanus.vi1.189>

