

*Yenidoğan Pnömotorakslı Hastalarda Anjiyocat ile Sualtı Drenajının Toraks**Tüpüne Göre Değerlendirilmesi**Underwater Drainage of Pneumothorax by Angiocath Versus**Thorax Tube in Newborn Patients*

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ÖZ

GİRİŞ ve AMAÇ: Pnömotoraks yenidoğan hastalarda morbidite ve mortalitesi yüksek olan önemli bir solunum sıkıntısı nedenidir. Semptomatik pnömotorakslı hastalarda acil olarak pleural boşluktaki serbest hava boşaltılmazsa ölümlerle sonuçlanabilir. Bu yazıda amaç pnömotoraks tanısıyla takip edilen hastaların, daha az agresif ve kolay bir yöntem olan branül ile kapalı su altı drenajı ile pleural boşluktaki serbest hava drenajının sağlanabildiğini işaret etmektir.

YÖNTEM ve GEREÇLER: Ağustos 2010 - Kasım 2015 tarihleri arasında yenidoğan yoğun bakım ünitesinde pnömotoraks tanısı ile yatırılan hastaların dosyaları retrospektif olarak incelendi.

BULGULAR: 2010 Ağustos -2015 Kasım tarihleri arasında yenidoğan yoğun bakım ünitemize toplam 1017 hasta yatırıldı. Bunların %1.6'sı (n: 17) pnömotoraks tanısı aldı. Ortalama vücut ağırlığı: 2314.7±1023.4 gram (730-3600gram), gestasyonel yaş ortalaması: 34.0±5.4 hafta (24-40 hafta) idi. İki hastada bilateral, bir hastada solda, 13 hastada is sağda pnömotoraks görüldü. Üç hasta herhangi bir girişim olmadan spontan düzeliirken, dört hastada tüp torakostomi, 10 hastada ise branül ile kapalı su altı drenajı sağlandı. Tüp torakostomi uygulanan hastalardan birinde tüp yerinden çıktığı için yeniden girişim uygulandı. Branül ile drenaj sağlanan hastalarda herhangi bir komplikasyon görülmedi. Primer tanı dokuz hastada respiratuar distres sendromu, beş hastada asfiksi-mekonyum aspirasyonu, üç hastada yenidoğanın geçici takipnesi idi. İki hasta kaybedildi.

TARTIŞMA ve SONUÇ: Pnömotoraksta zaman kaybı olmadan ve agresif cerrahi bir işleme maruz kalmadan yenidoğan pnömotorakslı hastalarda branül ile kapalı su altı drenajının, çocuk cerrahisi uzmanına ulaşılmadığında, yenidoğan konusunda belli tecrübesi olan hekimler tarafından kolay uygulanabileceğini düşünmekteyiz.

Anahtar Kelimeler: pnömotoraks, tedavi, yenidoğan

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SUMMARY

INTRODUCTION: Pneumothorax is a major cause of respiratory distress and associated with increased mortality and morbidity in newborn patients. The aim of this article was to emphasize the usability of underwater seal drainage with branule, which is a simple and non-aggressive method, in the treatment of newborn patients with pneumothorax.

METHODS: The medical records of patients who were hospitalized in the neonatal intensive care unit with a diagnosis of pneumothorax between August 2010 and November 2015 were investigated retrospectively.

RESULTS: A total of 1017 patients were hospitalized in our neonatal intensive care unit between August 2010 and November 2015. Of them, 1.6% (n: 17) had pneumothorax. The mean body weight was 2314.7 ± 1023.4 g (730-3600 g) and gestational age was 34.0 ± 5.4 weeks (24-40 weeks). Two patients had bilateral pneumothorax, one patient had left-sided pneumothorax, and 14 patients had right-sided pneumothorax. In three patients, pneumothorax spontaneously resolved without any procedure. Four patients underwent tube thoracostomy, and 10 patients were treated by underwater seal drainage with branule. In one of the patients who underwent tube thoracostomy, reintervention was performed because of the tube dislocation. The primary disease which caused pneumothorax was diagnosed as respiratory distress syndrome in nine patients, asphyxia-meconium aspiration in five patients, and transient tachypnea of the newborn in three patients. Two patients died.

DISCUSSION and CONCLUSION: In newborn patients with pneumothorax, underwater drainage with branule may be used by physicians experienced in neonatal care as a quick and easy procedure when a pediatric surgeon is not available to perform the relatively more difficult and aggressive option of thorax tube insertion.

Keywords: newborn, pneumothorax, treatment

INTRODUCTION

Pneumothorax is a major cause of respiratory distress in newborn patients. Pneumothorax occurs more frequently in the neonatal period than at any other time of life (1,2). Pneumothorax is most often seen in the first three days of life. Pneumothorax is associated with increased mortality and morbidity (3). It occurs due to mechanical ventilation therapy, meconium aspiration syndrome, respiratory distress syndrome, and resuscitation in patients with perinatal asphyxia. Rarely, it can also develop spontaneously (4). Pneumothorax may be symptomatic and asymptomatic. Failure to remove free air in the pleural space in patients with symptomatic pneumothorax may result in death. Spontaneous recovery can also be seen in some patients if pneumothorax is below 20%. Small pneumothoraci may spontaneously resolve. Treatment includes drainage of air in the pleural space using needle drainage, underwater seal drainage with branule and tube thoracostomy techniques. Air in the pleural space is usually evacuated by tube thoracostomy in patients with symptomatic pneumothorax. The aim of this article was to evaluate the advantages and disadvantages of the underwater seal drainage with branule compared to thorax tube insertion in the treatment of pneumothorax in newborn patients.

MATERIAL and METHODS:

The medical records of patients who were hospitalized in the neonatal intensive care unit with a diagnosis of pneumothorax between August 2010 and November 2015 were investigated retrospectively. Information on medications, drainage methods, and duration of treatment were obtained from patient records. Their medical records were also evaluated for complications. The ethics committee approved for this study (No:139-19.04.2018).

RESULTS:

A total of 1017 patients were hospitalized in our neonatal intensive care unit between August 2010 and November 2015. Of them, 1.6% (n:17) had pneumothorax. Of the patients, 11 were male and 6 were female. The mean body weight was 2314.7 ± 1023.4 g (730-3600 g). The mean gestational age was 34.0 ± 5.4 weeks (24-40 weeks). Two patients were born in our hospital, and 15 patients were referred to our hospital from other medical centers. Two patients had bilateral pneumothorax, one patient had left-sided pneumothorax, and 14 patients had right-sided pneumothorax. In three patients, pneumothorax spontaneously resolved without any medical or surgical procedure. Four patients underwent tube thoracostomy, and 10 patients underwent underwater seal drainage with branule. In one of the patients who underwent tube thoracostomy, reintervention was performed because the tube was dislocated. No complications were observed in the patients who underwent underwater seal drainage with branule. The primary diagnosis was respiratory distress syndrome in nine patients,

asphyxia-meconium aspiration in five patients and transient tachypnea of the newborn in 3 patients. Two patients died, one of whom was 24, and the other one was 25 weeks of gestational age.

DISCUSSION

Pneumothorax is an urgent problem which may cause severe respiratory distress in newborn patients. The tension pneumothorax causing lung compression may result in death if not treated immediately. Four studies conducted in our country have reported that the mortality rate ranges from 20% to 38.6% (5-8). The mortality rate was found to be 11.7% in our study.

The purpose of treatment is to provide drainage of air in the pleural space and respiratory support. Air in the pleural space is traditionally evacuated by tube thoracostomy. Prior to this procedure, needle aspiration is performed to urgently relieve the suffering of patients.

Thoracic tube insertion with an underwater seal is a procedure that requires local anesthesia and a certain amount of time and experience. During thoracic tube insertion, local anesthesia is first implemented. Then, the skin and subcutaneous tissues are cut, and tissue integrity is degraded. The tube is inserted into the pleural space through the incision site using some force. Finally, it is sutured for fixation. It is not possible that someone who is not a specialist on this subject performs this procedure. Pulmonary perforation may develop during tube thoracostomy placement (5). In addition, the patient may get worse during the procedure because it requires a certain amount of time. It can be a quite aggressive method for the extremely preterm infants (3).

Underwater seal drainage with branule is used to drain air in the pleural space by a simple method such as creating a vascular access. Underwater seal drainage with branule is an easy and simple applicable procedure. First, the intervention area is cleaned and branule is inserted into the thoracic cavity under sterile conditions. Then, the needle is withdrawn from guide tube, and it is connected to underwater seal chest drainage system. After the oscillation is seen, it is fixed to the skin in a sterile manner. In newborns, air in the pleural space can be evacuated quickly by branule. In our ten patients, air in the pleural space was drained with an 18-gauge angiocatheter using this method. No complications were observed. The chest X-ray taken 1 hour after the placement of branule revealed that air in the pleural space was entirely or nearly drained. After the oscillation disappeared on average 3 days, drainage was terminated according to chest X-ray taken after four hours of clamping.

Newborns with pneumothorax are at high risk of mortality, which may exceed %40 in extremely preterm infants. A Cochrane review on pneumothorax management, focusing only on the adult population has been published (9). No systematic reviews are available on neonatal pneumothorax treatment.

In a study of S.S. İris et al.(10) reporting a mortality rate of 30%, they found that chest tube insertion and thoracentesis were found to be predictors of mortality in newborns with pneumothorax. In another study, it has been reported that there was no significant difference between underwater seal drainage

with angiocatheter and tube thoracostomy in terms of mortality and complication rates and that underwater seal drainage with angiocatheter is easier, less invasive and less time-consuming (11). Arda et al.(12) have reported that the insertion of a venous catheter is less costly and less invasive technique. Especially in premature infants, air in the pleural space can be easily drained without aggressive intervention. The gestational age of our ten patients was below 37 weeks.

We think that underwater seal drainage with branule can be easily implemented without loss of time and aggressive surgical treatment in newborn patients with pneumothorax by physicians who are experienced in newborns.

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