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POSTOPERATIVE SYMPTOMATIC IMPROVEMENT OF PECTUS EXCAVATUM PATIENT FOLLOWING NUSS PROCEDURE

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ПОСЛЕОПЕРАЦИОННОЕ СИМПТОМАТИЧЕСКОЕ УЛУЧШЕНИЕ У ПАЦИЕНТА С ВОРОНКООБРАЗНОЙ ДЕФОРМАЦИЕЙ ГРУДНОЙ КЛЕТКИ ПОСЛЕ ОПЕРАЦИИ ПО НАССУ

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Abstract. Pectus excavatum is a funnelling of posterior chest wall. Wide depression area is seen at mid sternum, particularly from 3rd to 7th costal cartilage. Genetic predisposition is not scientifically proved but defective embryogenesis is surely involved. Congenital pectus excavatum is a very common defect, but a congenital chest defect is very rare. Until the symptoms are not present, there is no need of its treatment. If the pectus excavatum has cardio-respiratory problem then it needs firstly, conservative treatment like supportive therapy (chest brace) and then, if supportive therapy fails, we should go for the surgical intervention.

Аннотация. Воронкообразная грудная клетка — это деформация стенки грудной клетки, при которой ее передняя стенка имеет воронкообразную форму. В середине грудины видна вмятина на уровне 3-7-го реберного хряща. Генетическая предрасположенность научно не доказана, но, несомненно, имеет место дефектное эмбриональное развитие. Врожденная воронкообразная деформация грудной клетки — весьма распространенный дефект, но врожденный дефект грудной клетки встречается очень редко. До тех пор, пока симптомы отсутствуют, лечение воронкообразной деформации не требуется. Если при воронкообразной деформации грудной клетки имеются проблемы с сердцем и / или респираторной системой, то сначала требуется консервативное лечение, такое как поддерживающая терапия (нагрудная скоба). Затем, если поддерживающая терапия не помогает, тогда только мы должны прибегнуть к хирургическому вмешательству.

Keywords: Nuss procedure, pectus excavatum, congenital deformity, thromboembolism, surgery.

Ключевые слова: операция по Нассу, воронкообразная деформация грудной клетки, врожденные пороки, тромбоземболия, хирургия.

Introduction

Pectus excavatum is a depression in the mid sternum area, either symmetrical or asymmetrical. It is totally a defect of embryogenesis, where the lack of connective tissue is seen. We have inspected a group of patients. In the lack of connective tissue, improper chest movement is observed. Symptoms like shortness of breath, exercise intolerance are also present. After a failed



conservative treatment only surgical treatment is recommended, where Nuss method can be used along with others. Nuss procedure is a mini-invasive procedure used for correction of pectus excavatum. Complications associated with Nuss procedure are pneumothorax, hemothorax and thromboembolism. Complications are more pronounced with this procedure than with the open surgical procedure. After the insertion of metal bar in the chest, the normal curvature of the chest is maintained. Most of the cardiac functions are restored. Complication like arrhythmia is absent. In most patients with mitral value prolapsed, the symptoms disappear after the Nuss procedure [1, 6-14]. With the help of thoracoscope Nuss procedure became easier than blind folded procedure. The prognosis is proved good [2].

Purpose: To compare symptomatic improvement of patient after operation, monitor change in the quality of life and compare pre-operative and post-operative compliances and vital signs.

Methods and Materials

We considered 12 patients. Pre-operatively, vital signs and present symptoms of the pectus excavatum were noted. Post-operative vital signs and occurrence and absence of symptoms were checked. The improvement was noticed in the results obtained. Function recovery of the lung was better after the Nuss procedure rather than after the Ravitch procedure [4]. On physical examination: inspection — funnel shaped chest deformity was seen, within normal limit on palpation, percussion and auscultation. All lab investigation including echocardiography was in normal limits and diagnosed with pectus excavatum (Figure 1, 2).

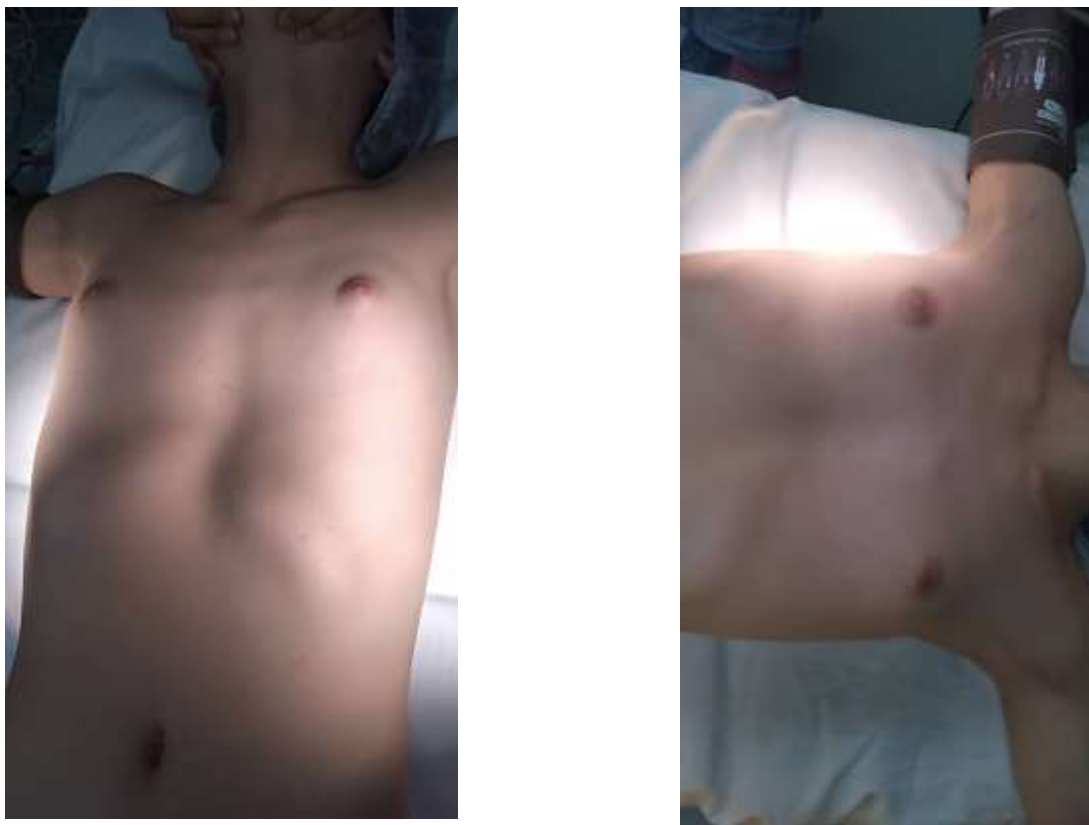


Figure 1. Thoracic deformation, view anterior



Figure 2. Thoracic deformation, view lateral

Results

The data was obtained from 12 patients (8 females and 4 males). The age bracket taken was 10–15 years. The pre-operative and post-operative variations are observed. Heart rate (HR) is reduced and SPO2 is significantly increased. Temperature and blood pressure (BP) remained unchanged (Table). Shortness of breath [SOB] is variable in the comparison. Cardio-pulmonary outcome and all compliances of heart and lung symptoms were improved comparing to the pre-operative condition. The patients had no complications after the procedure [3]. All functions of lungs like total lung capacity, FRC and tidal volume was remarkably increased and there was no shortness of breath of the Nuss procedure [5].

Table

TEMPERATURE AND BLOOD PRESSURE (BP) REMAINED UNCHANGED

PATIENT No.	PRE-OPERATIVE [SOB(+)]	POST-OPERATIVE [SOB (-)]
1. AGE- 12 FEMALE	HR-105/min SPO2-85% Temp-37 BP-105/66	HR-72 SPO2-96%
2. AGE- 15 FEMALE	HR-114 SPO2-88% TEMP- 36 BP-102/60	HR-79 SPO2-98%
3. AGE- 14 MALE	HR-109 SPO2-90% TEMP-38 BP-110/66	HR-81 SPO2-96%
4. AGE-13 FEMALE	HR-107 SPO2-85% Temp-37 BP-106/60	HR-85 SPO2-100%
5. AGE- 15 FEMALE	HR-108 SPO2-90% Temp-37 BP-114/67	HR-74 SPO2-99%
6. AGE-11 MALE	HR-112 SPO2-90% TEMP-36 BP-108/64	HR-72 SPO2-98%
7. AGE-13 FEMALE	HR-114 SPO2-90 TEMP-37 BP-109/67	HR-74 SPO2-96%
8. AGE-11 MALE	HR-105 SPO2-87% Temp-36 BP-111/68	HR-74 SPO2-94%
9. AGE-14 FEMALE	HR-113 SPO2-85% Temp-36 BP-112/69	HR-81 SPO2-99%
10. AGE-13 FEMALE	HR-108 SPO2-87% Temp-36 BP-109/65	HR-84 SPO2-97%
11. AGE-10 MALE	HR-113 SPO2-86% Temp-37 BP-114/67	HR-82 SPO2-95%
12. AGE-14 FEMALE	HR-111 SPO2-90% Temp-36 BP-114/69	HR-81 SPO2-98%

Discussion

Most of the patients were presented with the symptoms of shortness of breath and exercise intolerance. Most of the patients were born to multiparous women, born at term. They were vaccinated following the vaccination schedule. No genetic history was detected. No connective tissue disorder was detected.

Child up to 1.5 years — no any chest deformity was detected. After 1.5 years chest deformity was detected but was treated conservatively up to 12 years. After 10 years, the patient had symptoms of shortness of breath with mild exertion. Patient was consulted with a paediatric traumatologist (Figure 3).

Finally, it was diagnosed with pectus excavatum (2nd degree) in sub compensation stage. The

patient was consulted and recommended for a surgery. Nuss procedure was performed. All patients were commanded to lay in supine position. Under the aseptic condition, painting and draping was done. On the mid axillary line at the level of 6th intercostal space, 4 cm incision was done. Soft tissue was dissected and under control of thoracoscope, from left to right introduced by the introducers. Guide plate was inserted and with the help of the guide plate, the real plate was inserted inside the thorax under control of video assisted thoracoscope (Figure 4).



Figure 3. Consultation with a pediatric traumatologist. Recommendation for surgery.



Figure 4. The real plate was rotated to 180 degrees. Chest deformity was corrected and came to a normal shape

This plate is fixed on the ribs by the threads in four places. After fixation, haemostasis and revision was done. The plural cavity was drained by drainage. Wound was profusely cleaned and closed. Post-operative complications like pneumothorax, hemothorax and thromboembolism was not recorded. On post-operative day, 1–5 vitals were normal. Wound site was cleaned, daily dressing and removal of drainage was done, after 7 days skin suture was removed. Patient regained her chest compliance. The symptoms like shortness of breath and exertions were absent after the operation.

Conclusion

After the Nuss procedure, correction of cardio-respiratory symptoms was seen. Post-operative complications like pneumothorax and hemothorax was not observed, the situation can be variable for other patient. Most relevant thing is here: patient regained with the cardio-respiratory compliance and cosmetically. Post-operative chest X-ray showed mechanical correction of the ribs and sternum positions. After 2 to 3 years metal plates should be removed and should be checked for chest compliance.

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