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PREFACE

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CHAPTER 1

INTERTROCHANTERIC FEMORAL FRACTURES FIXATION TYPES: DHS VERSUS PFN

Alkan BAYRAK[1]

INTRODUCTION

Intertrochanteric femur fracture (IFF) is common in elderly patients, especially in post-menopausal women, usually due to low-energy trauma, such as simple falls (1). However, IFF occurs in young patients with high energy, such as vehicle injuries (2). The purpose of treatment of IFFs is a stable fixation for early mobilization and return to pre-fracture activity levels. Early mobilization is important for preventing complications, such as deep veneous thromboembolism (DVT), decubitis ulcers and improving patient functions (3).

Patients with IFFs are exposed to significant morbidity and high mortality (4,5). Co-morbid medical problems like diabetes, hypertension, pulmonary, renal and cardiac problems usually are accompanied by these fractures in elderly patients (6). Early reduction and stable surgical fixation prevent complications, such as avascular necrosis, non-union and it allows early mobilization (7). Co-morbidities increase the risk of surgery in those patients.

Epidemiology

In the near future, the geriatric population will probably rise, and the incidence of osteoporotic bone fractures will commonly be seen in the orthopedic practice. While 26% of all hip fractures occur in Asia constitute IFFs in 1990, this rate is expected to reach 37% in 2025 and 45% in 2050 (8). The number of hip fractures was reached 1.66 million in 1990, and it is predicted to rise to 6.26 million by the year 2050 (9).

The risk of fracture increases in women with a higher rate rather than men due to menopause (10). The risk of fracture incidence exponentially increases in women in the elderly population. IFF prevents mortality and morbidity.

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rotation screw can be inserted (18). This anti-rotational screw provides additional mechanical stability for osteosynthesis and improves axial and rotational stability (18). PFN has two lag screw and one dynamic distal screw. It can provide advantages for axial loading (30). PFN is an intramedullary device and it is closer to the force vector line of action through the center of the femoral head and has a shorter lever arm (31).

In the literature, many studies emphasized that DHS and PFN have same surgical duration and average blood loss (32). PFN provides more biomechanical stability and load sharing, and it is preferred in unstable and osteoporotic bone fractures (33). DHS mostly preferred in stable AO/ASIF type A1-fractures (32). Talmaç et al. emphasized that PFN damages the abductor muscles more than DHS (34). PFN has developed in different versions. PFN-A also has simple usage and it is preferred by many surgeons.

In conclusion, PFN and DHS are the minimally invasive methods for intertrochanteric femoral fractures. Both surgical implants have different advantages. It is reported in many studies that PFN is preferred for unstable and osteoporotic bone fractures (34). DHS provides a short learning curve and low radiation rates (34).

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CHAPTER 2

ANESTHESIA AND AIRWAY MANAGEMENT IN BRONCHOSCOPIC LUNG VOLUME REDUCTION TREATMENTS

Ayşe Pelin GİRGİN[1]
Aşkın GÜLŞEN[2]

INTRODUCTION

Bronchoscopic lung volume reduction (BLVR) procedures have become an important treatment option in selected patients with severe emphysema due to their non-invasiveness and rapid postoperative hospital discharge (1). They include volume reduction with valves, coils, thermal vapor ablation, airway bypass stents, and biological materials. All of these procedures are applied to one lung first, then to the other lung after approximately 4–8 weeks. Anesthesia management during BLVR procedures is very difficult because the majority of patients have stage III or IV chronic obstructive pulmonary disease (COPD), impaired respiratory function (severe obstruction, increased residual volume, and/or increased total lung capacity) and associated changes in blood gas values (hypoxia or hypercarbia), and other related comorbidities. Most patients undergoing BLVR have a higher physical condition than Class III, according to the American Society of Anesthesiologists (ASA) (2). The reported incidences of postoperative mortality in patients with each ASA classification are 0.1% for ASA-I, 0.7% for ASA-II, 3.5% for ASA III, 18.3% for ASA-IV, and 93.3% for ASA-V (3) (Table 1).

Unlike surgical volume reduction, endoscopic methods are generally applied through an endotracheal tube. Therefore such methods require airway sharing between the endoscopist and the anesthesiologist who perform the intervention. An algorithm is urgently needed to secure the airway during the procedure. This chapter explains the patient preparation required for BLVR procedures, and the principles of anesthesia required to perform the procedure safely.

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Postoperative Care

Patients with severe emphysema should be monitored for 24 hours after BLVR procedures. Such procedures can lead to complications such as COPD exacerbation, pneumonia/pneumonitis, minor hemorrhaging, coughing, and chest pain. Although rare, they can also be associated with pneumothorax, valve-related problems (displacement, expectoration, migration), and cardiac complications. The effects of bronchospasm, pain, coughing, hypotension, and prolonged sedation that develop in patients during the postoperative period should be treated immediately. Blood gas checks should be performed in patients with basal hypercapnia before treatment. BLVR procedures performed with general anesthesia or MAC generally cause a modest increase in PaCO2 (mean 11 mmHg) (8). These values return to basal levels within 2 hours. There are multiple reports that BLVR coil treatments have positive effects on blood gas (20,21), but these effects generally emerge within 6–12 months after the procedure.

Conclusion

The increasing frequency of BLVR procedures in recent years has necessitated the development of a reliable and effective anesthesia method to use during these procedures. Although different anesthetic approaches are used in different centers, a common consensus is needed to determine the most appropriate anesthesia method based on the collective results of multiple studies conducted over time. Anesthesia applications can contribute to a successful treatment outcome in patients undergoing BLVR. The anesthesiologist's experience plays a key role in patient preparation, management of perioperative complications, and postoperative care.

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CHAPTER 3

INVESTIGATION OF THE RELATIONSHIP BETWEEN METHYLENETETRAHYDROFOLATE REDUCTASE, METHIONINE SYNTHASE REDUCTASE, METHIONINE SYNTHASE GENE VARIATIONS AND DEVELOPMENT OF BREAST CANCER

Gürcan ALBENİZ[1]
Nevra ALKANLI[2]

INTRODUCTION

Cancer that occurs in the breast, which is known as the distinguishing feature of pubertal development in women, starts anywhere in the breast. Breast cancer is caused by the growth and division of abnormal cells. Breast cancer, one of the oldest known forms of malignancy and that can spread to other organs, is one of the leading causes of death for women worldwide. The development of human breast cancers is a multistage process resulting from genetic changes, and this process involves the conversion of normal breast epithelial cells into malignant derivatives. There are several studies showing that there is a relationship between folate metabolism imbalance and cancer susceptibility. Folate metabolism pathway plays an important role in the regulation of intracellular folate pool for the synthesis and methylation of deoxyribonucleic acid (DNA). Serum folate, which enters the tissue cells via folate receptors, is converted to tetrahydrofolate through dihydrofolate reductase. Tetrahydrofolate is also converted to 5,10-methylenetettahydrofolate. Then Methylenetetrahydrofolate reductase (MTHFR) converts 5,10-methylenetetrahydrofolate into 5-methyltetrahydrofolate, which provides a methyl group necessary for the transformation of homocysteine to methionine. This conversion reaction is catalyzed by methionine synthase (MTR). The cobalamin I cofactor is oxidized to form cobalamin II, which causes inactivation of MTR, which makes cobalamin a coenzyme. Methionine synthase reductase (MTRR) enzyme plays an important role in the reverse conversion of

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CHAPTER 4

BIOPSY PRINCIPLES IN MUSCULOSKELETAL SYSTEM TUMORS (MST)

Mesut MISIRLIOĞLU[1]

The biopsy site should be determined according to the final surgery and should be carefully planned and performed by oncological surgeons experienced in musculoskeletal tumors (MST). It is always necessary to strictly follow the rules when taking a biopsy. Adequate active tumoral mass should be obtained for histological examination in the shortest possible way without spreading the tumor tissue to the surrounding tissues. The selection of the biopsy should be determined based on the size, location of tumour and experience of the pathologist. Biopsy is not a shortcut for diagnosis, it is a diagnostic method that should be applied last. All clinical and radiological examinations must be reviewed beforehand.

INTRODUCTION

MST's are rare tumors originating from bone and soft tissue, making up 1% of adult tumors. With the development of neoadjuvant and adjuvant therapies and limb-sparing surgical techniques, there has been a significant increase in quality of life and surveys of MSTs in recent years. In reaching the diagnosis, the patient's age, history, physical examination findings, laboratory tests, bone retained, radiological and clinical parameters, and laboratory results can provide important clues. The growth rate of the lesion, pain, neurological symptoms, its relationship with other tissues, its depth and mobility are important parameters for diagnosis. An effective clinical evaluation will increase the success of diagnosis and treatment. Assessment should be customized for each patient based on the behavior of the audience. The most correct approach in the diagnosis of MSTs is to make clinical, radiological and pathological evaluations together (1).

Possible differential diagnosis of the lesion is tried to be revealed whether it is malignant or not with the use of different radiological examinations (Xray, ultrasonography, computed tomography (CT), magnetic resonance (MR), scintigraphy). The imaging features of most MST are not specific, and histopathological

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CHAPTER 5

GASTRIC NEUROENDOCRINE TUMORS

Metin LEBLEBİCİ[1]

INTRODUCTION

Tumors originating from endocrine enterochromaffin-like cells are defined as gastric neuroendocrine tumors (gNETs) [(1)]. These tumors may also be defined as "gastric carcinoid" or "endocrine tumor" [(2)]. gNETs are also defined as "NET" as they were seen to be consistent with both endocrine and neural tumors when evaluated histopathologically and clinically [(2)].

Tumors which could not be classified between adenoma and carcinoma, which usually do not cause metastases and grow slowly, and small tumors with better prognosis than carcinomas were first classified as "carcinoid tumor" in 1907 [(3)]. Carcinoid tumors are classified as foregut, midgut and hindgut embryologically [(4)]. The first gastric tumor was reported by Askanazy in 1923 [(5)]. When making different histological classifications in case series [(6)], World Health Organization (WHO) made studies at different times for classification of these tumors [(7, 8)]. Although carcinoid tumors were defined as endocrine tumor by WHO in 1980, they were re-classified as NET by Capela et al. in 1995 [(9)]. NETS classification had the final form according to clinical and histo-pathological features as the result of collaboration of European Neuro-endocrine Tumor Society and WHO in 2010 [(10)]. Well-differentiated NETs with mitosis count of <2/10 hpf and Ki index<3% are classified as low grade tumors. Well-differentiated NETs with mitosis count of 2-20/10 hpf and Ki index 3-20% are classified as well- differentiated intermediate grade tumors. Poor-differentiated NETs with mitosis count of >20/10 hpf and Ki index >20% are classified as poor- differentiated high grade tumors, neuro-endocrine carcinomas.

Although NETs are rare, incidence was found to be 6.98 per 100000 individuals in current literature [(11)]. Of NETs, 60% are located in gastro-intestinal tract and of them, less than 12% are located in stomach [(12)]. Incidence of NETs increases in all age groups in epidemiologic and screening studies. Increase rate is 8-fold greater in particularly over 65 years. The increase in NETS incidence arises from

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CHAPTER 6

METHODS FOR THE AVOIDANCE OF ABDOMINAL COMPARTMENT SYNDROME IN LOSS OF DOMAIN HERNIA TREATMENT

Salih TOSUN[1]

INTRODUCTION

The treatment of loss of domain hernia (LODH) is a difficult situation for surgeons and has many related postoperative complications, including abdominal compartment syndrome (ACS) [1]. Besides the complexity of the treatment, high rates of recurrence after surgical treatment are challenging factors for surgeons [2-6]. The most common risks for incisional hernia are diabetes, advanced age, obesity, type of incision, immune suppression, male sex, wound infection, and pulmonary co-morbidities [2, 3, 7-9].

The surgery of the LODH has a risk of morbidity of 10–15%. It is also associated with 1–2% mortality. In patients with LODH; chronic muscle retraction that had developed after the previous surgery, reduces the volume of the peritoneal cavity. The decrease in the volume enables potential problems such as ACS, respiratory restriction, and a higher risk of hernia recurrence after the fascial closure [10, 11].

Certain factors can be mentioned to classify incisional hernia such as the location, width, recurrence, stage of the hernia defect and symptoms. However, LODH is a prime descriptor of hernia size and likely to be related to operative outcomes. Therefore, a standardized definition of LODH is essential [12].

Tanaka described the formula of incisional hernia sac volume (VIH) / abdominal cavity volume (VAC) with CT evaluation as a solution for the complicacy of defining the pathology and suggestions for the surgical planning [13].

Diameters of the VAC and VIH can be calculated by CT scan. It is assumed that both chambers were ellipsoid. Cranio-caudal (Z), anteroposterior (Y) and latero-lateral (X) diameters should be obtained to calculate the volume of an ellipsoid. The formula of was used for the calculation of abdominal/ hernia volume.

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