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Contents

Irregular Volume 9 Number 1 September 27, 2020

EDITORIAL

CASE REPORT

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Irregular Volume 9 Number 1 September 27, 2020

Contents

ABOUT COVER

Editorial board member of *World Journal of Anesthesiology*, Dr. Amr Salah Omar, MBBch, Msc, PhD, MD, MBA, is Professor at Beni Suef University (Egypt). After completing his PhD in Critical Care Medicine from Cairo University in 2003, he undertook further graduate study at University of Liverpool (United Kingdom), being awarded an MBA in 2014. In 2016, he was granted the position of Assistant Professor at Weill Cornell Medicine-Qatar, which led to his current position as Senior Consultant Intensivist in the Cardiothoracic Surgery Department of Hamad Medical Corporation (HMC; Qatar). His career research efforts in hemodynamic monitoring, mechanical circulatory support and glycemic control have yielded over 40 peer-reviewed publications and been presented at more than 30 international conferences. Dr. Omar has received three innovation grants from HMC and the Qatar Science and Technology Park (member of the Qatar Foundation) over the last 4 years. (L-Editor: Filipodia)

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EDITORIAL

Low dose corticosteroids in COVID-19 with refractory shock: We are not sure?

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Abstract

Low dose corticosteroids to adult patients with coronavirus disease 2019 (COVID-19) and refractory shock was given some evidence, the evidence was of low quality given particularly for shock-reversal. Evidence. However bacterial sepsis may not provide a similar evidence like in a viral related one. We think that suggesting steroids for COVID-19 may not be adequate in the current time and future data analysis should be directed to find possible evidence in a matched population

Key Words: Corticosteroids; Sepsis; Shock; COVID-19; Refractory; Outcome

Core Tip: We think that suggesting steroids for coronavirus disease 2019 may not be adequate in the current time and future data analysis should be directed to find possible evidence in a matched population.

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INTRODUCTION

With great interest we followed the recent guidelines for managing critically ill adult patients with coronavirus disease 2019 (COVID-19) that was released from the Surviving Sepsis Campaign. The writing group gave a weak recommendation for giving low dose corticosteroids to adult patients with COVID-19 and refractory shock, the evidence was of low quality given particularly for shock-reversal[1]. The utility of low dose corticosteroids plus fludrocortisone therapy were presented in a study by Annane *et al*[2], the authors found a lower 90-days all-cause mortality in the corticosteroids treated group when compared with placebo confirming adrenocortical insufficiency in these patients.

We argue that the given evidence in bacterial sepsis may not provide a similar one in a viral related one. Delayed viral redemption, diabetes, psychosis, and avascular necrosis could exist, plus absence of survival benefit which was found in a systemic review analyzed observational studies of corticosteroids in patients with severe acute respiratory syndrome related to viral invasion[3]. In a recent study by Arabi *et al*[4], done on 309 patients infected with middle east respiratory syndrome (MERS), the authors did not find a mortality advantage in the corticosteroid treated population after utilizing an adjusted time varying statistical approach for confounders. Moreover, they observed delayed clearance of MERS coronavirus RNA.

In many cases of viral invasion, the reason for shock remains unclear, however it could be due to viral myocarditis or stress cardiomyopathy where corticosteroids could be of no value or adding additional harm to this dilemma[5]. In Annane[2]'s trial, adequacy of the starting antimicrobial regimen was judged first according to insulting pathogen sensitivity and the site of infection in 96.2% and 96.9% of the patients who received antimicrobials either placebo or corticosteroids respectively. The later coverage does not exist till now for COVID-19.

CONCLUSION

We think that the indirect evidence used for suggesting steroids for COVID-19 may not be adequate in the current time and future data analysis should be directed to find possible evidence in a matched population.

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CASE REPORT

Unusual bronchoscopic value in percutaneous dilatational tracheostomy: A case report

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Abstract

BACKGROUND

The usage of bronchoscopy during percutaneous dilatational tracheostomy remains under debate. The proponents of bronchoscopy advocating safety of the procedure, whereas the critics raising the concerns about the cost, possible delay in the procedure, and waiting for the device.

CASE SUMMARY

We are highlighting a case of percutaneous dilatational tracheostomy where bronchoscopy aided in diagnosing a rare situation of wire entrapment within the endotracheal tube, treated by withdrawing the wire from the endotracheal tube with good outcome.

CONCLUSION

The bronchoscopy guided approach permitted early diagnosis and helped to end the procedure without complication or possible major surgery in a case of accidental wire puncture of the endotracheal tube.

Key Words: Bronchoscopy; Percutaneous; Tracheostomy; Outcome; Complication; Case report

Core Tip: Bronchoscopic guided approach made diagnosis help to end the procedure without complication or possible major surgery.

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INTRODUCTION

Percutaneous dilatational tracheostomy (PDT) is a minimally invasive procedure that has greatly replaced surgical technique in modern intensive care units (ICU)[1]. The procedure is safe, rapid and effective in establishing long term airway for patients with long term ventilatory requirements[2]. The use of bronchoscopy during the procedure was suggested, as it provides tracheal visualization, during needle insertion, tracheal dilatation and tracheostomy tube placement[3]. In a recent single center study comparing both techniques, the authors found that PDT using blind technique was as safe as the bronchoscopic one, in terms of incidence of reported complications[4]. Additional advantage of cost effectiveness was described by Taha *et al*[5]. We are highlighting a case of PDT where bronchoscopy played a pivotal role in saving the patient from potential catastrophe.

CASE PRESENTATION

Chief complaints

A 56-year-old man was admitted to the ICU after cardiac surgery, he had a complicated course and prolonged mechanical ventilation, requiring percutaneous tracheostomy after 14 d of intubation.

History of present illness

The patient's course was complicated with stroke and inability to wean from mechanical ventilation.

History of past illness

The patient is a nonsmoker, not known to have diabetes mellitus; he had 10 years history of essential arterial hypertension, he had also dyslipidemia. A coronary angiography done 6 months prior to surgery showed three-vessel disease for surgical intervention. His routine medications included atenolol (50 mg/d), acetylsalicylic acid (150 mg/d), and rosuvastatine (10 mg/d). The patient had family history of ischemic heart disease and dyslipidemia.

Physical examination

The patient pre-procedure examination showed dimished conscious level with inability to protect his airways. The vital signs showed temperature of 37.0 °C, blood pressure of 110/66 mmHg, heart rate of 71 beats/min, and oxygen saturation of 97% on mechanical ventilation with FIO2 of 30%. The heart rate was regular. The rest of cardiac, chest and abdomen examinations were unremarkable.

Laboratory examinations

Laboratory work-up was unremarkable.

Imaging examinations

Computed tomography (CT) scan showed multiple lacunar infarctions.

FINAL DIAGNOSIS

The patient was scheduled for percutaneous tracheostomy due to delayed recovery and expected prolonged hospital course. The procedure was done under bronchoscopic guidance, the needle followed by the guide wire were noted to pass into the trachea. Successive dilatations by the small followed by the large blue Rhino dilators were carried out, the procedure ended with insertion of the adequately sized tracheostomy tube over the respective dilator. Attempt to withdraw the wire was met with difficulty in the form of resistance, this aroused suspicion of abnormal course of

wire or its entrapment. The bronchoscope was passed through the tracheostomy tube revealing acceptable position and level of the tracheostomy tube, the point where the wire was stuck could not be identified through the tracheostomy tube. The bronchoscope was withdrawn and advanced again through the endotracheal tube (ETT), it was noted that wire punctured the terminal end of the ETT distal to the Murphy's eye and got entrapped in this position (Figure 1). The case was diagnosed as wire entrapment in the ETT after accidental trocar puncturing.

TREATMENT

After careful bronchoscopic inspection the best option was to withdraw the ETT from the mouth, which pulled the wire accordingly.

OUTCOME AND FOLLOW-UP

The procedure ended smoothly, and the patient was left in a stable condition without any procedure related complications, follow up chest X-ray was unremarkable.

DISCUSSION

Percutaneous dilational tracheostomy (PDT) became a standard procedure since its introduction at by Cigalia more than 30 years back[6]. However, the safety of the procedure remains questionable. The concomitant use of bronchoscopy was associated with a significant reduction of the trachesotomy related complications in the early reports[7]. Identifying the place of the first tracheal puncture, confirming the position of the needle are additional bronchoscopic guided procedure advantages[8]. However, Taha and Omar performed a randomized controlled trial comparing bronchoscopic and blind techniques and argued that blind technique could be as safe as the bronchoscopy guided one, when experience exist[5]. Sampling of the airway could be an additional advantage in patients with suspected airway infection[9]. In our patient the bronchoscope provided an unusual advantage that needs to be highlighted. Our case emphasized this role when a gentle trial to remove the wire from tracheostomy end failed after which we elected to withdraw the ETT, the wire followed the tube without further complications (Figure 2).

CONCLUSION

The bronchoscopy guided approach permitted early diagnosis and helped to end the procedure without complication or possible major surgery in a case of accidental wire puncturing of the endotracheal tube.

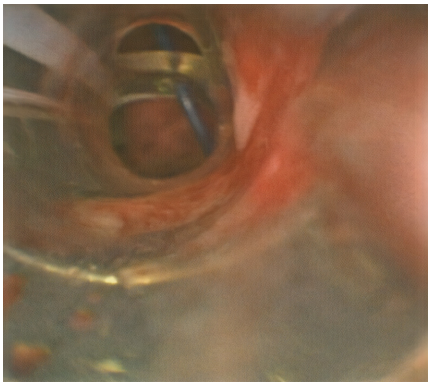

Figure 1 Percutaneous tracheostomy wire is noted to puncture the endotracheal tube (bronchoscopic view).

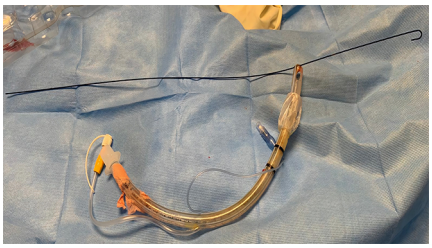

Figure 2 Endotracheal tube removed, and the wire is stuck distal to the Murphy's eye.

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CASE REPORT

Cement-related embolism after lumbar vertebroplasty: A case report

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Abstract

BACKGROUND

Cement-related embolism is a rare but potentially fatal complication in spinal surgery. Cardiac echocardiography can provide valuable information for the early identification.

CASE SUMMARY

A 66-year-old woman who underwent lumbar vertebroplasty and internal fixation under general anesthesia experienced an episode of supraventricular tachycardia and ventricular tachycardia at the end of surgery. Point-of-care echocardiogram revealed a foreign body in the right heart. After conservative treatment in the intensive care unit, her family decided on comfort care and she expired.

CONCLUSION

Transthoracic echocardiography may provide early valuable information in patients undergoing vertebroplasty, and mild-moderate pericardial effusion may be a significant sign of a poor outcome.

Key Words: Cement embolism; Vertebroplasty; Transthoracic echocardiography; Pericardial effusion; Perioperative management; Cardiovascular event; Case report

Core Tip: With an aging population and increasing tumor occurrence, there is an ever-growing demand for vertebroplasty surgery. Cement related embolism subsequently increases. We recommend echocardiography in the early identification of cement embolism and foreign body with pericardial perfusion should be paid more attention.

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INTRODUCTION

Cement augmented pedicle screw instrumentation of the thoracolumbar spine is indicated in spinal metastasis to release pain and stabilize the vertebral body. The incidence of cement leakage in multi-level vertebroplasty is more than 65%, and the incidence in single-level vertebroplasty is even higher[1,2]. Cement-related embolism is a rare but potentially fatal complication, with an incidence of 4.6%-7.9%[2,3]. Those with advanced age, metastatic bone disease, osteoporosis, underlying cardiovascular disease, and patent foramen ovale were reported to be at higher risk[4]. Early screening and detection are crucial for these patients, and point-of-care echocardiography can provide valuable information in the clinical setting. Cardiac effusion revealed in echocardiogram examination may be a significant indicator of a poor outcome. Here, we report a case of cement-related pulmonary embolism following vertebroplasty for spinal metastasis.

CASE PRESENTATION

Chief complaints

A 66-year-old woman, complaining of back pain and lower limb weakness for about 2 mo, was referred from the orthopedics clinic to the inpatient department.

History of present illness

The patient underwent radical mastectomy 8 years ago for breast cancer, followed by chemotherapy and endocrine therapy. Six months ago, she was admitted to the emergency room, presenting with proximal femoral fracture. After surgical femoral head replacement, biopsy of the femur suggested metastatic breast adenocarcinoma. The patient had type 2 diabetes mellitus that was controlled by insulin injections for 10 years.

Laboratory and imaging examinations

Lumbar magnetic resonance imaging showed that there were occupying lesions at the level of T12 to S3 vertebrae and vertebral pedicle, suggestive of metastases. The patient was diagnosed with breast cancer and multiple bone metastases according to clinical evidence. Laboratory examination results were within normal limits, including hematological, coagulation, kidney, and liver functions as well as electrolytes. Electrocardiogram revealed tachycardia with a heart rate of 110 bpm. Preoperative transthoracic echocardiography (TTE) showed normal contraction function with an ejection fraction of 71% and normal diastolic function with a septal e' value of 12 cm/s. Chest X-ray did not show any abnormalities. Physical examination revealed normal cardiorespiratory findings, but low back tenderness and lower extremity weakness.

Intraoperative management

Invasive blood pressure, SpO_2, lead II electrocardiogram, end-tidal concentrations of inhalational anesthetics and carbon dioxide, nasopharyngeal temperature, bispectral index, and urine output were monitored during surgery. Intravenous access was obtained using an 18G cannula before induction and a central venous catheter was inserted after the induction of general anesthesia. General anesthesia was induced with sufentanil (targeted controlled infusion at an effect-site concentration of 0.5 ng/mL), 60 mg propofol, 7 mg etomidate, and 50 mg rocuronium. After successful intubation, anesthesia was maintained with inhalation nitrous oxide, propofol (25-30 mL/h) infusion, and sufentanil (targeted controlled infusion at an effect-site concentration of 0.1-0.3 ng/mL) to achieve appropriate depth of anesthesia and pain control. Cis-atracurium was intermittently administered to ensure muscle relaxation. The patient was placed in the prone position and her eyes and nose were protected to avoid bruising. Hemodynamics management was guided by the stroke volume variation and cardiac index. When the surgery was finished, an episode of supraventricular tachycardia and ventricular tachycardia occurred without unstable hemodynamics. A 4-mL bolus of 2% lidocaine was administered intravenously to alleviate the arrhythmia. Arterial blood gas results were within normal limits (K^+ 4.8

mmol/L and lactate 1.0 mmol/L). The patient then recovered and was extubated with sinus tachycardia of 110 bpm, intra-arterial blood pressure of 140/90 mmHg, and SpO_2 of 95%.

FINAL DIAGNOSIS

After transferred to the post-anesthesia care unit, TTE was performed by a skillful anesthesiologist. A hyper-echogenic material signal was observed in the right heart, across the tricuspid valve area extending to the right ventricular apex. This sign might indicate a foreign body. Both foreign body and pericardial effusion could be detected on the apical four chamber view, parasternal long axis view, and subxiphoid four chamber view under TTE (Figure 1). With the exception of sinus tachycardia which already existed preoperatively, her general vital signs were within the normal range. We made a preliminary diagnosis of cement-related embolism. Subsequently, coronary angiography confirmed the presence of cement within the right heart and right pulmonary (Figure 2). She was finally diagnosed with cement-related embolism, and received non-invasive ventilation support afterwards.

TREATMENT

Due to advanced stage of the tumor and lung embolism and high risk of treatment, her family refused surgical embolectomy and percutaneous emboli removal and decided on comfort care.

OUTCOME AND FOLLOW-UP

The patient experienced dyspnea and progressive heart failure due to cement-related embolism. She eventually expired.

DISCUSSION

The incidence of vertebroplasty related symptomatic pulmonary cement embolism is reported to be approximately 3% to 23%, according to different imaging methods[5]. Common complications in vertebroplasty include rib fracture, cement leakage, and anaphylactic reaction, with or without hemodynamic turbulence[6]. Although this procedure was strictly monitored using good-quality fluoroscopy for vascular leakage, in our case, cement embolism caused by perivertebral venous migration was not identified early in the operating room. What's more, real-time detection of lateral-vertebral leakage was difficult due to overlap of the cement filling the vertebral body.

Lack of robust detection of the embolism was due to atypical vital signs in the early stage. The best management of cardiac and pulmonary cement-related embolism in this situation is worthy of debate[7]. Surgical approaches, such as cardiovascular intervention or open cardiac surgery, the best timing for removal of the cement emboli, and patient preference need to be discussed on a multidiscipline basis.

The diagnosis of cardiac cement in our case was determined in the post-anesthesia care unit, and the patient was quickly transferred to the intensive care unit for further treatment. A review of the literatures revealed that conservative treatment may be recommended rather than surgical removal except for extensive obstruction[8]. Moreover, quite a few patients were diagnosed ranging from 10 d to 6 years after surgery due to clinical symptoms[9-12]. As shown in our case, mild-moderate pericardial effusion shortly after surgery may be a significant indicator of a poor outcome. Table 1 summarizes several reported cases with early detection of cement embolism by echocardiography during or shortly after surgery. Most cases requiring surgical treatment were associated with pericardial effusion.

Transthoracic echocardiogram is an inexpensive and non-invasive examination, and could probably provide valuable information in such patients. This case emphasizes the importance of early detection of cardiac and pulmonary embolism using polymethylmethacrylate during vertebroplasty, especially the identification of pericardial effusion. However, prospective clinical trials on this issue are still limited.

Table 1 Summary of case reports on the early detection of cement-related embolism patients during/after lumbar surgery by echocardiography

Ref.	Age/gender	Echocardiography finding/whether pericardial effusion present	Clinical features and occurrence time	Treatment	Outcome
Cohen[13],2012	65 yr/ female	Foreign body in the right ventricle/with little pericardial effusion	Ventricular tachycardia intraoperatively	Progression to right ventricle failure and surgical removal	Uneventful recovery
Tran *et al*[14], 2013	68 yr/ female	Tamponade	Cardiac shock during coronary angiography after lumbar surgery	Percutaneous catheterization removal	Recovery
Elapavaluru *et al*[15], 2015	61 yr/ female	Hyper-echo foreign body in the apex of the left ventricle/pericardial effusion not clearly mentioned	Acute hypoxic respiratory failure within 24 h postoperatively	Mitral valve replacement under cardiopulmonary bypass	Discharged home
Puri[16], 2016	75 yr/ female	Foreign body in right heart/large pericardial effusion	Chest pain, tachycardia, and hypotension the following day	Surgical removal	Discharge with a normal sinus rhythm
Andrä *et al*[7], 2017	62 yr/ female	Hyper-echo foreign body in the right atrium/8-mm wide pericardial effusion	Severe tachycardia and hypotonia intraoperatively	Surgical removal	Stable cardiorespiratory condition
Adu-Gyamfi *et al*[17], 2019	86 yr/ female	Cement traversing the tricuspid valve into the right ventricle/without pericardial effusion	Shortness of breath immediately after surgery	Medicine treatment	Discharged home

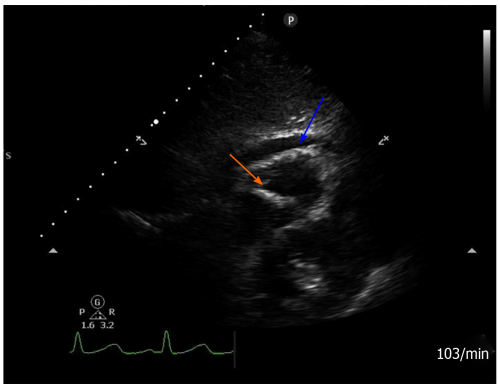

Figure 1 Postoperative transthoracic echocardiography view. Subxiphoid four chamber view modified for the right ventricle showing a hyperechogenic linear-shaped image attached to the apical portion of the right ventricle (orange arrow), and pericardial effusion (blue arrow).

CONCLUSION

Anesthesiologists should be aware of spinal metastasis and the anatomy of the vertebral venous system, and master the technique of transthoracic echocardiogram to minimize perioperative cardiovascular risks during vertebroplasty. Attention also should be paid to the early detection of pericardial effusion.

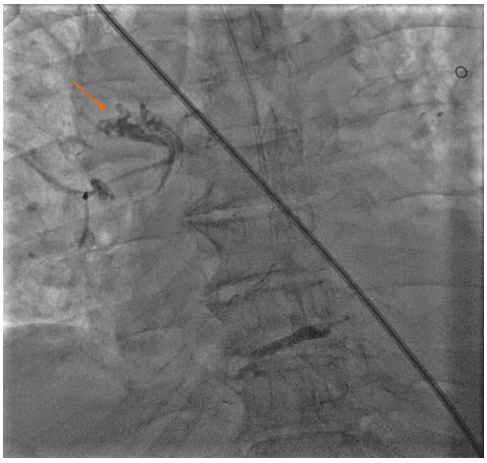

Figure 2 Postoperative coronary angiography examination. Coronary angiography showed an opaque lesion on the right pulmonary artery (orange arrow).

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