CASE REPORT

Omentoplasty as an effective surgical modality for managing a high risk patient with deep sternal wound infection

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Abstract

Poorly managed diabetes and hypertensives are risk factors for deep sternal wound infection (DSWI) following cardiac surgery; leading to increased morbidity and mortality. To reappraise the effectiveness of omental flap in the management of High risk patient with DSWI. A middle aged man with extensive mediastinitis following cardiac surgery (from outside referral). He was a known Diabetic and Hypertensive who was poorly compliant on medications. The history, physical examination, gycosylated Haemoglobin (HbA1c) and microbiological analyses showed high blood pressure, poor glycaemic control, septicaemia with staphylococcal DSWI. Resuscitation was achieved with the use of oral antihypertensives, Human insulin and antibiotics respectively. The DSWI was managed with serial debridement and subsequent wound cover with omental flap. The hospital stay was shorter and outcome was good. The management of DSWI with omental flap may be an effective surgical modality that reduces morbidity and mortality even in high risk patients.

Key words: Cardiac surgery, high risk, omentoplasty

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Introduction

Deep sternal wound infection is rare[1,2] and has a serious effect when it occurs[1,2] There are literatures highlighting the risk factors for DSWI and the surgical options with varying degree of success[2,3]

Diabetes and hypertension are important risk factors DSWI[1,3,4] and predictor of even poor outcome in terms of increased morbidity and mortality[3,4] Managing the patients with debridement and subsequent closure might not improve positive outcome as the patient may require resternotomy[4] with added morbidity and mortality.

The greater omentum is rich in macrophages and localizes infection, even in heterotopic setting. This may lead to improved clinical outcome of the patients in taking care of the local sepsis by localizing the infection and destruction of the bacteria which may be an aetiology. Also it provides a good covering avoiding deformity which may result with the use of pectoralis major flap for instance. Thus the management of DSWI with omental flap may be an effective surgical modality that reduces morbidity and mortality.

The aim of this communication is to highlight the effectiveness of the omental flap in the management of deep sternal wound infection with a good clinical outcome even in a high risk patient with poorly controlled blood glucose and hypertension.

Case Report

A 55 year old man, known diabetic and hypertensive

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who had chronic stable angina and had Coronary Artery Bypass Graft(CABG) in an outside facility 12 days before presentation in our center coronary care unit(CCU). At the referral hospital,he had Left Internal Mammary Artery (LIMA) anastomosed to the left anterior descending artery(LAD) and the sapheneous Vein Graft (SVG) to Posterior lateral branch artery(PLB) and subsequently developed DSWI 5 days after the surgery (in the referring hospital) for which debridement, rewiring and closure were done.

He presented with extensive pus discharge from the wound and clinical examination showed he was febrile(38.9°C), tachypnoeic and restless but not dehydrated.

A diagnosis of DSWI with septicaemia was made and he was placed on intravenous Imipenem 500-mg 6 hourly; intravenous metronidazole 400-mg 8 hourly; intravenous Teicloplasnin 800 mg stat,400-mg daily and was admitted into intensive care unit(ICU) for subsequent surgery.

The blood investigation showed the following parameters; the Haemoglobin(Hb) was 11.3-g/dl, the White Blood Count(WBC) was 168000/cm^3 with differential lymphocytosis, the glycosylated Haemoglobin(HbA1C) was 11.1%, the Creatinine was 0.8-mg/dl and the Urea was 28-mg/dl. He was also placed on tab ramipril 2.5-mg daily, Tab Atorvastatin 20-mg daily, tab Metoprotol 50 mg twice daily and Human insulin 4 internationall Unit 1 hourly to control the blood pressure and blood glucose respectively.

He had wound exploration, debridement and tissue taken for bacteriologic analyses. The gram staining yielded gram positive cocci and culture yielded coagulase negative staphylococcus species which was sensitive to cefuroxime and ciprofloxacin and changes effected appropriately. The wet preparation showed no fungal elements and Zhein Nelson stain(direct and concentrated) revealed no acid fast bacilli(our previous report has implicated *Mycobacterium tuberculosis* as aetiology)[1]

The intraoperative showed extensive pus in the mediastinum with totally destroyed and unhealthy sternum. Tissues were very unhealthy and the heart covered with a thick pyogenic membrane.

All the sternal wires were removed, sternectomy done, tissues debrided and scooped out anteriorly, washed with normal saline and subsequently packed with gauze.

He was admitted in ICU and placed on mechanical ventilation.

When the wound was reviewed 24 hrs afterwards and was found still not healthy another debridement was done in the same fashion and another 24-h inspection showed a fair looking wound with pyogenic membrane covering the heart. He had omentoplasty. The Pectoralis major muscle and subcutaneous tissue flap were created at both sides of the costal margins. Skin edges were cut and incision was extended below the xiphoid region from the wound. The peritoneum was opened and dissection started on the left. To achieve adequate omental length, the omentum gastric attachments were carefully dissected off and the left gastroepiploical artery sacrificed after feeling for the pulsations and also, alternatively occluding them to determine the competence of the arch. The short vessels were individually clamped and ligated as far distally as the antrum and duodenum. After the division, the omental flap was taken along the greater curvature and pedicled on the right gastoepiploical artery while palpating for the pulsation to avoid kinkly occluding it during transfer. The omental flap [Figure 1] was fixed on both sides of the costal margins with 4/0 prolene. Tension sutures applied and The overlying subcutaneous layer and skin closed with 2/0 ethicon sutures or later which involved [Figure 2]. He was admitted to ICU and chest radiograph done on 2nd day post surgery revealed left pleural effusion for which left chest tube drainage was instituted with subsequent chest radiograph on the ward showed adequate lung re-expansion and effusion completely drained.

He stayed in the ICU for 5 days and was discharged to the ward and stayed in the ward for 7 days before getting discharged to home and was seen in Out -Patient clinic in 1 week and thereafter followed up for 3 months in the last 1 year with good surgical scar. No evidence of epigastric hernia or chest wall deformity was present.

Discussion

The incidence of sternal wound infection is about 0.8% and 1% when left Internal mammary artery (LIMA) was used[1]. Diabetes and Hypertension are well known important risk factors as documented in the literatures[1,5,7].

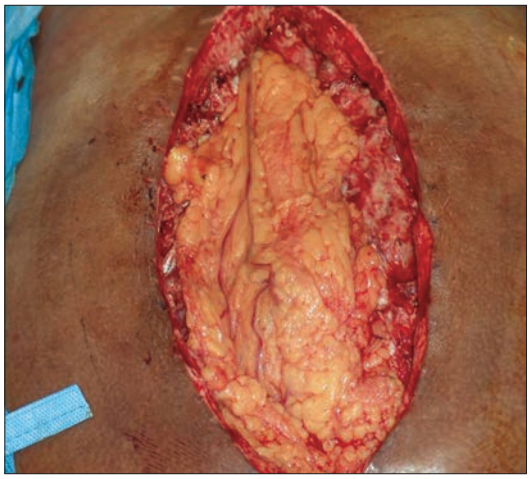

Figure 1: The omental flap on the floor of the wound

Figure 2: Tension sutures applied and skin closed with sutures

And the dual are also predictors of poorer outcome in terms of morbidity and mortality as observed by Hiroaki *et al*, especially in perioperative condition like the case we presented and it was for the same reason, Kathryn *et al* emphased the need of achieving glucose control as a way of lowering the risk of wound infection in diabetics after open heart surgery[8].

The clinical case presented had all the negative factors that would otherwise, expectedly, impact negatively on the outcome.

In the literatures, the findings on the use of pectoralis major muscle in the treatment of DSWI were chest wall deformity, resternotomy and increased mortality[4] and one would have theorized an even a worst outcome in this patient with poorly controlled diabetes and hypertension and previous sternotomy and rewiring with extensive mediastinitis, septicaemia and extensive loss of sternum.

However, omental flap use was able to curtail the local sepsis while patient recovered with acceptable surgical scar with improved clinical outcome. There was no escalated cost and no mortality.

Conclusion

Omentoplasty as even a first choice in the managing of sternal wound infection should be encouraged as it effectively localizes infection even in high risk patient with poorly controlled diabetes and hypertension with positive impact on clinical outcome.

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