TREATMENT OF COMPLETE STERNAL DEHISCENCE WITH A COMBINATION OF EDINBURGH UNIVERSITY SOLUTION (EUSOL) AND SURGICAL SCRUB POVIDONE IODINE

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Abstract

Sternal dehiscence is an uncommon but usually lethal complication of cardiac surgical procedures. Various treatment modalities are used to manage this potentially lethal complication. The aim of our study was to assess the effect of a combination of Eusol and surgical scrub povidone Iodine (EPI dressing) on healing of complete stemal dehiscence. The effect was evaluated in 8 patients with sternal dehiscence. All patients were treated successfully. 2 of them underwent plastic surgery at the final stage of their treatment. No complication was apparent during the treatment. We can conclude that the EPI dressing is at present time a safe alternate method for treatment of difficult to heal wounds such as sternal dehiscence.

Keywords
Wound healing, sternal dehiscence

INTRODUCTION

Sternal dehiscence due to osteomyelitis is an uncommon but usually lethal complication of cardiac surgical procedures.[1,2] The treatment of this complication is frequently combined with long term ventilatory support, antimicrobial therapy and local care.[3] Plastic surgery is sometimes provided with doubtful effects.[4] Local wound care is frequently difficult due to the presence of necrotic and infected parts as well as a risk of mediastinitis leading to cardiac or great vessel perforation.[5,6]

We have developed a different system for wound treatment, which is based on combined use of Eusol and povidone iodine (surgical scrub). Surgical scrub of povidone iodine has strong affinity for water and therefore keeps moisture in the wound areas. Moreover it modifies inflammatory responses and stimulates Leukocyte movement in wounds, which can positively influence wound repair. It also possesses a significant anti-adhesive effect, which is accompanied by the anti-microbial effect of iodine.[7,8,9,10] Its use when preceded by a strong oxidizing agent, would theoretically give a good combination for antisepsis, tissue regeneration and protection from secondary infection.

Therefore we assessed the effect of EPI dressing on treatment of sternal dehiscence in 8 patients. The aim of our study was to assess the effect of a combination of Eusol and surgical scrub povidone Iodine (EPI dressing) on healing of complete stemal dehiscence.

MATERIALS AND METHODS

During last four years (2002 – 2005), we have treated 8 patients with complete sternal dehiscence. 7 of them underwent coronary bypass surgery, and in one woman replacement of the mitral valve. After admission to our department, all-necrotic sternal fragments were removed. The wounds were cleaned and liberally irrigated with Eusol for 5 – 7 minutes. Then the wounds were soaked and painted thoroughly with surgical scrub of povidone iodine. Lastly, they were dressed with gauze impregnated in same povidone iodine. Patients were treated until healed secondarily or definitive plastic surgery.

RESULTS

Within 2-3 weeks after the onset of treatment, all wounds was dirt free, and they contained granulations. After six weeks the clean granulation tissue filled most of the defects. Reconstructive plastic surgery was required in two

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patients. Complete healing without surgical treatment was achieved in 6 patients. The longest treatment (5 months) was necessary for one woman who had a large defect with complete removal of her sternum.

DISCUSSION

Sternal dehiscence due to osteomyelitis is a rare but usually lethal complication of cardiac surgical procedures.[2,11] The treatment of this complication is frequently connected with long term artificial ventilation, antimicrobial therapy and local care[3] Plastic surgery is sometimes provided with doubtful effects due mainly to the presence of infection. Local wound care is frequently tedious due to the presence of necrotic and infected parts as well as a risk of mediastinitis with resultant cardiac or great vessel perforation.[6,12]

We have developed a different system for wound healing, which is based on combined use of Eusol and povidone iodine. Let us examine, both the constituents of this therapy. First part, Eusol is a very strong oxidizing agent, and thus can be used safely in general ward setting, with relatively less than perfect asepsis. A secondary infection is a frequent occurrence in many instances. Eusol is a good choice in this situation.[13] It also promotes granulation.

Second part, Surgical scrub of povidone iodine has an anti-microbial effect, that may last for hours.[14] It has strong affinity for water and therefore keeps moisture in wounded areas. Moreover it modifies inflammatory responses and stimulates leukocyte movement in wounds. It can also positively influence wound repair. It possess also a significant anti-adhesive effect, which is accompanied by the anti-microbial effect of iodine. Its use when preceded by a strong oxidizing agent, would theoretically give a good combination for anti-sepsis, tissue regeneration and protection from secondary infection. Therefore we believe that this improvement in wound is related to the unique combination of Eusol with an iodine complex which works as immune cell activator, has angiogenic properties and strong affinity to water and anti-microbial effects.

We can conclude that the EPI dressing is at present time a safe alternate method for treatment of difficult to heal wounds such as sternal dehiscence.

REFERENCES

1. Matthias Anthuber, Bernhard M. Kemkes, Ekkehard Kreuzer, et al. Mediastinitis and Mycotic Aneurysm of the Aorta after Orthotopic Heart Transplantation. Tex Heart Inst J. 1991; 18(3): 186–193.
2. Jutta Draganov, H. Michael Klein, Ali Ghodsizad et al. Rupture of a Saphenous Vein Coronary Artery Bypass Graft. Ann Thorac Surg. 2005;80;2;725-6.
3. Massimo Massetti, Sebastien Veron, Eugenio Neri et al. Long-term durability of resection and end-to-end anastomosis for ascending aortic aneurysms. J Thorac Cardiovasc Surg 2004;127:1381-1387
4. Mills SA, Salem W. Complications associated with the use of heterologous bovine pericardium for pericardial closure. J Thorac Cardiovasc Surg 1986; 92: 446–9.
5. Katsumata T, Moorjani N, Vaccari G, Westaby S. Mediastinal false aneurysm after thoracic aortic surgery. Ann Thorac Surg 2000; 70: 547–52.
6. Coselli JS, Crawford ES, Williams TW Jr, Bradshaw MW, Wiemer DR, Harris RL, et al. Treatment of postoperative infection of ascending aorta and transverse aortic arch, including use of viable omentum and muscle flaps. Ann Thorac Surg 1990; 50: 868–81.Tetsuya Ueno, MD,
7. Tsati E, P.Panayotou P, Ioannovich J. Moist exposed burn therapy: evaluation of the wound healing process. Aug. 2004; 27;4; 171-7
8. J. Daróczy Antiseptic Efficacy of Local Disinfecting Povidone-Iodine. Dermatology 2002;204:75-78
9. Breborowicz, A., Polubinska, A., Moberly, J., Delo, K., Martis, L., Oreopoulos, D. Hyaluronan modifies inflammatory response and peritoneal permeability during peritonitis in rats. Am. J Kidney Dis.2001; 37, 594-600.
10. Chen, W.YJ., Abatangelo, G. Wound Repair Regen.2000; 7,79-89.
11. Secondary Rupture of Aorta Following the Surgical Management of Aortoesophageal. Jin et al. Asian Cardiovasc Thorac Ann.2005; 13: 374-

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12. Razzouk A, Gundry S, Wang N, Heyner R, Sciolaro C, Arsdell GV, et al. Pseudoaneurysms of the aorta after cardiac surgery or chest trauma. Am Surg 1993; 59: 818–23.
13. Hanzah M, Marshall J, Breach NM. Eusol; Plastic surgeons' choice. 1996; Aug; 41(4)269-70.
14. Paula Moyer, Desiree Lie. Povidone Iodine irrigation may prevent wound infection following surgery. Spine. 2005;30:1689-1693.