

## Four cases of aggressive MRSA wound infection following head and neck surgery

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### Abstract

Four cases of serious MRSA wound infection following head and neck surgery have been identified. One patient died. At post mortem a mediastinal abscess containing MRSA was found to have eroded into the innominate artery causing fatal haemorrhage. The other three suffered serious wound infections, two requiring further surgery. Once MRSA had been identified they were treated with intravenous teicoplanin and all made a full recovery.

**Key words:** Methicillin resistance; Head and neck neoplasms, Surgery; Teicoplanin

### Introduction

Wound infection is a significant cause of morbidity and mortality following head and neck surgery. Invasive infection may cause the wound to break down leading to salivary fistulas or even carotid artery rupture. Most infections are acquired from the skin, gastrointestinal tract (particularly the mouth) or nosocomial sources. The most common organisms found are Gram negative bacilli, *Staphylococcus aureus*, *Streptococcus* spp. and anaerobes (Swift, 1988; Brook, 1989; Bumpous and Johnson, 1995).

More recently the increase in the number of methicillin resistant *Staphylococcus aureus* (MRSA) wound infection has caused concern due to its resistance to conventional antistaphylococcal antibiotics and its ability to spread rapidly between patients in a hospital setting (Doebbeling, 1995).

MRSA was first identified in about 1960 shortly after the introduction of methicillin, a close relation of flucloxacillin. Occasional infections occurred in individual hospital patients but the organism did not become endemic. The first 'epidemic' strain of MRSA was identified in Australia in the late 1970s and rapidly spread to other parts of the world. This strain reached the UK in 1980 and caused outbreaks in the south-east of England. Sixteen epidemic strains of MRSA (EMRSA) have now been identified in the UK.

A major outbreak in the Liverpool Royal Infirmary, including the ENT/Head and Neck unit in 1992 was eradicated by isolation of affected patients and extensive screening and treatment of other patients and healthcare workers. In 1994 the number of cases of MRSA started to rise and the causative organism, EMRSA-15, is now endemic. It particularly affects care of the elderly, intensive care, orthopaedic and vascular surgery patients.

The majority of patients identified have been colonized by MRSA, but serious infections may occur. We report four cases of invasive MRSA infection following head and neck surgery causing serious complications and death.

### Case reports

#### Case 1

An 89-year-old lady was initially treated with radiotherapy for a T<sub>3</sub> left alveolar squamous cell carcinoma in view of her age and the patient's wishes. Six months later a recurrence was found in the left retromolar trigone. A left jaw-neck dissection was performed with a pectoralis major flap reconstruction. Two weeks post-operatively the floor of the mouth and skin of the flap became grossly infected and MRSA was cultured. Due to the significant risk of mandibular osteomyelitis she was commenced on intravenous teicoplanin and gentamicin. Within three days the wound began to improve, with less debris and a healthier flap. Steady progress was made and after seventeen days the iv antibiotics were stopped, as the flap had almost healed. She was discharged 10 days later with a gastrostomy *in situ* for feeding due to persistent aspiration. Four months later she is eating soft food and drinking well with a healed floor of mouth.

#### Case 2

A 49-year-old gentleman presented with a left nasal discharge, facial discolouration and epistaxis secondary to a left maxillary squamous cell carcinoma. He underwent a left radical maxillectomy, left orbital exenteration, left sphenoidal clearance and reconstructed with a rectus abdominis vascularized free flap. Initial progress was excellent, with the flap maintaining its shape and position. Ten days post-operatively the flap began to sag and two days later he was taken to theatre for removal of a necrotic flap and temporary packing of the cavity. Five days later a second rectus abdominis free flap was sewn into the defect. After two days the left orbital area became infected as did the abdominal wound which began to dehiscence. Intravenous ceftazidime and metronidazole were commenced but two days later the result from swabs revealed MRSA. Intravenous teicoplanin and topical

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mupirocin cream were started and a steady improvement occurred. The patient was discharged home four weeks later and attended for a course of radical radiotherapy with no further wound complications.

### Case 3

A 35-year-old gentleman underwent total pharyngolaryngo-oesophagectomy and stomach transposition due to strong suspicion of recurrent pharyngeal carcinoma following radiotherapy. The operation included a pectoralis major musculocutaneous flap to free up skin contractures in the neck. During a difficult resection the upper end of the oesophagus and the posterior wall of the trachea were breached and repaired. Bilateral chest drains were inserted. Post-operatively he bled profusely from the left chest drain and a thoracotomy was performed, revealing a laceration in the lung apex. This area had been tethered to the chest wall and damaged on insertion of the chest drain. He developed a degree of ARDS but slowly began to recover. On the 19th day post-operatively he suffered a massive haemorrhage from the lungs and died of hypovolaemic shock. At post mortem a ragged tear about 1 cm long was found in the innominate artery adjacent to a mediastinal abscess which was continuous with the right main bronchus, culture showed growth of MRSA. Histology showed a completely excised carcinoma of the hypopharynx but there was metastatic carcinoma in the peribronchial tissues.

### Case 4

A cachexic 50-year-old gentleman was referred with extensive (T<sub>4</sub>) recurrence of a T<sub>3</sub>N<sub>1</sub> carcinoma of the larynx which had been treated with radiotherapy. Following two weeks of nutritional support he underwent total laryngectomy and tongue base resection with a right functional neck dissection and right pectoralis major flap reconstruction. One week post-operatively he developed neck and chest wound infection with some skin necrosis and wound dehiscence. Shortly after a salivary fistula developed on the left directly over the carotid artery and a second pectoralis major flap was performed to protect the artery and repair the fistula. Swabs taken before the repair revealed the growth of MRSA and so oral trimethoprim and intravenous teicoplanin were initiated. One week later another salivary fistula developed on the right side of the neck close to the stoma, accompanied by further neck and chest wound dehiscence (Figures 1 and 2). As MRSA was thought to be a significant factor gentamicin was added and



Fig. 1

MRSA infection of the neck wound, with right salivary fistula.

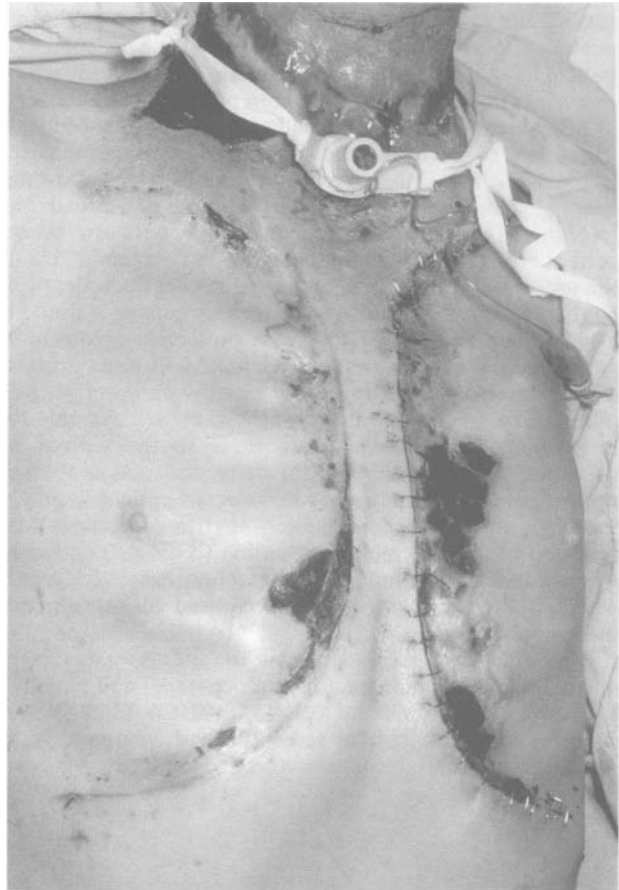


FIG. 2

MRSA infection affecting the skin of the chest.

the dose of teicoplanin increased. The wound slowly improved and two weeks later the antibiotics were stopped, this resulted in deterioration of the wound and antibiotics were restarted. Two more weeks of iv. antibiotics and continued oral trimethoprim resulted in healing of the fistula and wound infections. He was discharged home a month after the last procedure.

### Discussion

MRSA behave like other strains of *Staphylococcus aureus*. They cause the same profile of infections particularly wound infection and pneumonia and their virulence is variable. Epidemic strains are able to colonize and spread rapidly, particularly in institutions such as hospitals. MRSA are always resistant to antistaphylococcal antibiotics such as flucloxacillin, Augmentin and cefuroxime and may be resistant to other classes of antibiotics such as erythromycin and gentamicin. They have never been found to be resistant in a clinical setting to teicoplanin or vancomycin. Teicoplanin is usually the drug of choice as it has been shown to be less nephrotoxic than vancomycin and does not require regular monitoring of blood levels. It can be administered as a once daily intravenous dose due to its relatively long half life (Wood, 1996). Less serious infections can be treated with oral agents such as trimethoprim, fusidin or rifampicin. Nasal carriage is usually treated with topical mupirocin.

The MRSA infection in the cases presented was almost certainly acquired in hospital. Sources include other patients, health care personnel, the ward and operating theatres. Direct contact between patients or use of the

same facilities and linen can spread infection. Healthcare personnel may transfer MRSA directly from an infected patient to another patient, on their hands, other body parts or even clothing. A few health care personnel are carriers of MRSA, the organism is usually resident in the nose and transferred to the hands and then a patient when the nose is touched. Transmission can be reduced by following hospital guidelines on the prevention of spread of infection. These include washing hands between every patient even if no open or infected wound is examined and the use, when appropriate, of clean and aseptic techniques by the nursing and medical staff. Barrier nursing is used in all identified cases of MRSA with protective aprons and gloves used in addition to thorough hand antisepsis. Spores of MRSA can survive for many months on curtains and other ward upholstery from which they are difficult to remove and transmission from these to the patient is possible. Regular washing of the upholstery and swabbing the room after occupation of an infected patient help. In the cases presented it is unlikely that the infection was acquired in the operating theatre due to the gap between surgery and the development on infection, except in Case 2 where MRSA may have been acquired at the second operation.

There has been some debate in the literature as to the necessity for screening health care personnel and patients for MRSA infections and colonization. Cookson (1997) suggests that with careful screening and treatment it is possible and indeed cost-effective to treat patients and carriers with MRSA in an effort to reduce the potentially serious infection rate in hospitals. Teare and Barrett (1987), however, argue that as MRSA represents no more serious a threat than any other outbreak of pathogens it should be treated in the same way. They argue that screening is not cost-effective and that any infection including MRSA should only be treated on the basis of clinical need.

These four cases quite clearly show the potentially serious nature of MRSA wound infections following head and neck surgery. They demonstrate that aggressive treatment with intravenous teicoplanin and other antibiotics is effective when the infection can be identified.

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