Conflict of interest
None.

Funding
None.

Ethical approval
Brighton and Sussex Ethics Committee.

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References


Introduction

As patients with Meticillin-resistant Staphylococcus aureus (MRSA) colonisation are at risk of subsequent infection, premorbid identification and decolonisation should reduce infection and transmission. Therefore, the Department of Health in England introduced screening of all elective patients for MRSA in a 2009 working framework, suggesting this may be cost-effective. The original guidance made certain clear exceptions, including minor dermatology, commenting that MRSA infection rates were sufficiently low to negate cost economy. Plastic surgery at our hospital is limited to local anaesthetic day case procedures; complex cases or those requiring general anaesthesia are treated at a regional centre. Typical patients include benign and malignant skin excisions with direct wound closure, or utilising local flaps or skin grafts. MRSA screening of elective patients (nose, throat, axilla and groin) was introduced in 2009 as this speciality was not explicitly exempt. As a practical and

* This study has not been published or presented elsewhere.
cost-saving measure, patients are swabbed on the day of surgery and have GP follow-up for MRSA decolonisation should they need it. This is a similar situation in many other institutions.

We aimed to determine how common MRSA colonisation and post-operative infections are these patients, to inform analysis of how cost-effective, and therefore valid, the national guidance is in this cohort.

**Methods**

We performed a retrospective review of 2488 consecutive admissions for local anaesthetic, day case procedures carried out our plastic surgery department between March 2009 and April 2011. Demographics and swab results were obtained using coding data and cross-referenced with the microbiology laboratory results. The clinical records of positive cases were reviewed for co-morbidities, MRSA risk factors (such as previous colonisation or infection, multiple hospital attendances, and residing in a care home, as previously described) and complications such as surgical site infections and bacteraemia. Details of post-operative decolonisation results and surgical site infections diagnosed in the community were obtained from primary care records.

**Figure 1** Types of surgery performed by senior author during this time period (n = 1232, data represented as %). Pathology is given on left, closure technique on right. SCC, squamous cell carcinoma; BCC, basal cell carcinoma; MM, malignant melanoma; FTSG, full thickness skin graft; STSG, split thickness skin graft; FC, fasciocutaneous graft.

**Table 1** Overview of cases with MRSA colonisation on admission.

<table>
<thead>
<tr>
<th>Case</th>
<th>Age</th>
<th>Sex</th>
<th>MRSA risk factors</th>
<th>Co-morbidities</th>
<th>MRSA No.</th>
<th>Operation year</th>
<th>Operation</th>
<th>Date of post-op swab &amp; result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>76</td>
<td>F</td>
<td>None</td>
<td>None</td>
<td>1</td>
<td>2009</td>
<td>Excision of keratosis</td>
<td>15/04/2009 — negative</td>
</tr>
<tr>
<td>2</td>
<td>84</td>
<td>F</td>
<td>Multiple previous positive swabs, recent admissions to other hospitals</td>
<td>Previous squamous cell carcinoma</td>
<td>2</td>
<td>2009</td>
<td>Excision biopsy of squamous cell carcinoma</td>
<td>16/06/2011 — negative</td>
</tr>
<tr>
<td>3</td>
<td>68</td>
<td>M</td>
<td>Multiple previous positive swabs, recent admissions to other hospitals</td>
<td>Chronic leg ulcer, long-standing colitis on azathioprine</td>
<td>3</td>
<td>2009</td>
<td>Excision of basal cell carcinoma right forehead</td>
<td>25/04/2009 — negative</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>2010</td>
<td>Excision of recurrent basal cell carcinoma right temple</td>
<td>03/06/10 — negative</td>
</tr>
<tr>
<td>4</td>
<td>78</td>
<td>F</td>
<td>One previous positive swab, recent admissions to other hospitals</td>
<td>Melanoma, liver metastasis, recurrent chest infections,</td>
<td>6</td>
<td>2011</td>
<td>Failed skin graft</td>
<td>28/03/11 — coliforms</td>
</tr>
<tr>
<td>5</td>
<td>73</td>
<td>M</td>
<td>None</td>
<td>None</td>
<td>8</td>
<td>2009</td>
<td>Excision of recurrent basal cell carcinoma right temple</td>
<td>04/05/11 — negative</td>
</tr>
<tr>
<td>6</td>
<td>76</td>
<td>M</td>
<td>None</td>
<td>None</td>
<td>9</td>
<td>2009</td>
<td>Excision of keloid</td>
<td>04/06/2009 — negative</td>
</tr>
<tr>
<td>7</td>
<td>66</td>
<td>F</td>
<td>None</td>
<td>Osteoarthritis</td>
<td>10</td>
<td>2009</td>
<td>Scar revision</td>
<td>12/09/2009 — negative</td>
</tr>
<tr>
<td>8</td>
<td>66</td>
<td>F</td>
<td>Hypothyroidism</td>
<td></td>
<td>11</td>
<td>2010</td>
<td>Scar revision</td>
<td>17/10/2009 — negative</td>
</tr>
<tr>
<td>9</td>
<td>87</td>
<td>M</td>
<td>Multiple previous positive swabs, nursing home resident</td>
<td>Prostate cancer, infected foot ulcer</td>
<td>12</td>
<td>2010</td>
<td>Revision of skin graft</td>
<td>09/11/2009 — negative</td>
</tr>
<tr>
<td>10</td>
<td>64</td>
<td>M</td>
<td></td>
<td>Prostate cancer</td>
<td>13</td>
<td>2011</td>
<td>Excision of basal cell carcinoma right ear</td>
<td>20/05/2011 — negative</td>
</tr>
</tbody>
</table>

4 78 F One previous positive swab, recent admissions to other hospitals
5 73 M None
6 76 M None
7 66 F None
8 66 F None
9 87 M Multiple previous positive swabs, nursing home resident
10 64 M None

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**Correspondence and communications** 533
Results

Swab results were available for 2290/2488 procedures (92% compliance). Operative diversity is represented in Figure 1. There were 13 (0.56%) instances of MRSA colonisation at admission (see Table 1). One patient presented on four separate occasions with MRSA colonisation, giving a total of ten patients who were positive at some point. Of these 10, there were six new cases (0.26%) of MRSA colonisation recorded. The remaining four patients (in seven encounters, 0.30%) were known to have previous positive MRSA swabs and other risk factors for colonisation. There were no MRSA sequelae in this positive cohort, although one patient had delayed healing in one procedure caused by poor skin graft take. Overall, we found no MRSA bacteraemias, and only one patient (0.04%) who developed an MRSA wound infection requiring hospital attention. This case had a negative swab pre-operatively.

All positive patients had a course of decolonisation therapy following surgery according to protocol. Two patients became re-colonised with MRSA following this treatment, including the patient who presented positive on four occasions. This patient had negative cultures for MRSA after each decolonisation treatment.

Discussion

We found a very low incidence of MRSA colonisation in our patients. This supports previous findings in day case surgery (0.76%, \( n = 8446 \)). Assuming each case costs £8.88 to swab (£5.63 in laboratory costs and 15 minutes of band 5 nurse time at £3.25), £1564 was spent per identified case, increasing to £3389 per de novo case if those cases with MRSA colonisation risk factors are excluded. Interestingly, we found that only one patient from 2488 developed an MRSA post-operative complication, and they swabbed negative pre-operatively. This questions the rationale of universal screening in this low risk group, in keeping with evidence from other specialties, as patient outcome seems unaffected by screening and the cost is high.

A limitation of our work is that MRSA screening was performed on the day of surgery. As mentioned, this was a practical measure to cut costs and patient inconvenience from an extra clinic visit. However, this undermines the necessity of decolonisation in preventing complications as this was commenced several days after surgery, and still no complications were reported. Although the number of wound infections arising in the community in non-colonised patients is not known, we argue that if MRSA was responsible, this would be identified by culture alone and highlighted by our lab. The screening rate of 92% may also be a limitation, but is similar to other studies.

MRSA screening undoubtedly saves lives and money in high risk areas and emergency cases. Moreover, the importance of pre-operative medical optimisation and fastidious wound aftercare should be stressed in all patients, especially in context of preventing and combating MRSA related sequelae. However, we believe that this minor plastic surgery group should not be subject to universal screening but follow a selective approach using appropriate risk stratification.

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Conflict of interest

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Ethical approval

Not required.

References


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