

The importance of proper antimicrobial use for MRSA infections – Beware of rifampicin monotherapy induced resistance

Case: Male in 80s **Height:** 158.2 cm **Weight:** 60.1 kg
 BUN 24.2 mg/dL, Cre 1.02 mg/dL, eGFR 53.2 mL/min/1.73 m²
Medical History: MRSA osteomyelitis (after right hip replacement), asthma, hypertension, prostate cancer
Current History: Rash and itching from Year X-1. Patient was referred to the hospital's dermatology department for detailed examination on June, Year X-1. The patient had been taking ST mixture for treatment of MRSA osteomyelitis, but administration discontinued due to positive patch test. Treatment performed after hospital discharge. Patient was readmitted to dermatology department on September, Year X, due to worsening symptoms. Steroid therapy, immunoglobulin therapy (IVIG therapy), etc. were performed for:
 -Erythema multiforme
 -Bullous pemphigoid

Prescriptions at time of hospitalization (only antimicrobial drugs) on September, Year X:
 Rifampicin capsules 150 mg (RFP) 1 dose 2C 2 times a day after breakfast and dinner
 Cefdinir capsules 100 mg (CFDN) 1 dose 1C 3 times daily after each meal (no anti-MRSA activity)

Treatment for MRSA osteomyelitis; continuation of prescriptions + cleaning of hip fistulas
Hospitalization day 23, MRSA was detected from closed abscesses culture!
Day 24 Consultation with the Antimicrobial Stewardship Team

- Day 22: MRI showed no apparent abnormal findings suggesting osteomyelitis
- Recommendation on Day 25: discontinuation of CFDN and RFP drugs bought in.
- Consider administration of antibiotics if acute symptoms occur

March X (Former doctor, orthopedic surgeon, contracted) hospitalization day 23 (our hospital)
 Specimen: Exudate of right thigh wound Specimen: Closed abscess
 Detected bacteria: S. aureus (MRSA) Detected bacteria: S. aureus (MRSA)

Drug	MIC(μg/mL)	Rating	MIC(μg/mL)	Rating	
VCM	2.0	S	4.0 ↑	I	VCM Moderate Tolerance Increased MIC of TEIC
TEIC	≤ 1.0	S	4.0 ↑	S	
DAP	—	—	1.0	S	
LZD	—	—	0.5	S	
ABK	2.0	S	2.0	S	
RFP	—	—	> 2.0	R	RFP Resistance
ST	≤ 1.0	S	≤ 1.0	S	

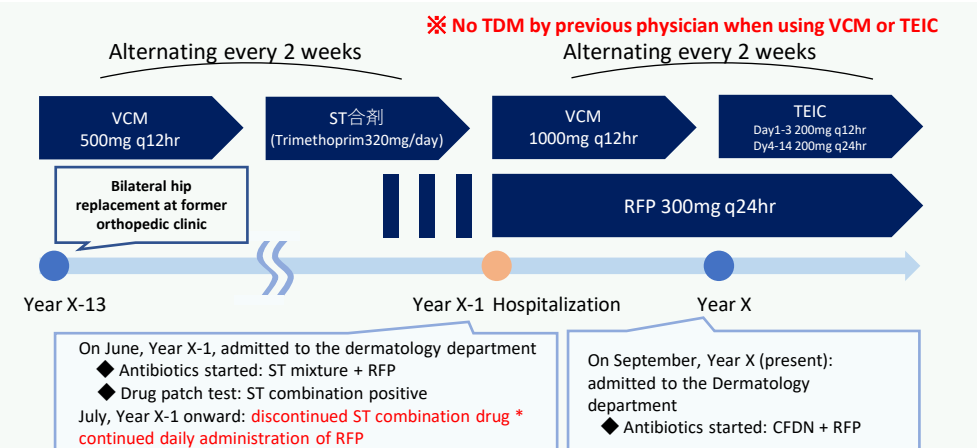


Figure 1. Previous Antimicrobial Use in Patients with MRSA Osteomyelitis

Points for Antibiotic Stewardship in the Treatment of MRSA Infections

- TDM is recommended for efficacy and selective suppression of low susceptibility strains (Antibiotic TDM Guidelines 2016)
- Use RIF in combination in combination with other anti-MRSA drugs because resistance tends to develop when used alone (Revised Guidelines for the Treatment of MRSA Infections 2019)

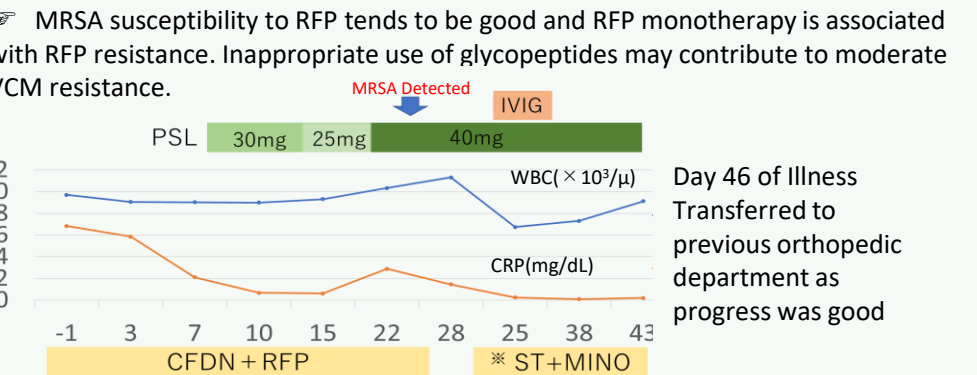


Figure 2. Post-hospitalization course

* No aggravation of rash after ST resumption

Bacterial infections in which antibiotic monotherapy contributes to resistance

- Quinolone monotherapy for tuberculosis
- Monotherapy of clarithromycin in nontuberculous mycobacteria

→ Combination therapy required for all cases. Appropriate initial diagnosis is crucial

Be careful when initiating treatment of pneumonia