There were only two isolates showing either *msrA* or *erm* gene. *lin A/linA'* gene is responsible to confer resistance to lincosamides only. It was found in the current study that all of the isolates (100%) contained this *linA* gene. It is uncommon for staphylococci to confer resistance only to lincosamides [41]. Although the incidence of *linA* gene to appear alone is low, there was one isolate (9.1%) with this condition, which contains *linA* gene alone without *msr* genes or *erm* genes. Most of the isolates contained *linA* gene in conjugation with *mrsA* gene, *erm* genes or both.

The *S. aureus* specific gene, *femA* which does not cross react with other bacteria such as *S. epidemidis* was used to identify pure *S. aureus*. Although *femA* sequences are phylogenetically conserved to staphylococci; however, *femA* for *S. aureus* is 78% homologous to the *femA* of *S. epidemidis* [42]. Therefore, there is a possibility of giving false positive *S. aureus*. In order to confirm that isolates were *S. aureus*, another gene, *nuc* gene was used together with the *femA* gene. In our study, ten of 11 isolates (90.9%) contained *femA* gene. However, only four of 11 isolates contained *nuc* gene.

Discrepant results were observed in our study. The antibiogram typing failed to detect methicillin resistance in 7 isolates (77.8%), 8 isolates (88.9%) for oxacillin resistance, 1 isolate (10% with *erm* genes and 11.1% with *msrA* gene) for erythromycin resistance. The sensitivity and specificity of the antibiogram typing compared with the PCR identification is shown in table 6. The methicillin resistance is attributed to the expression of *mecA* gene which produces low affinity penicillin binding protein 2a (PBP2a), or in rare cases, attributed to the hyperproduction of the β-lactamase enzymes or production of altered binding capacity proteins [3,5-7]. However, the presence of *mecA* gene does not always mean that *S. aureus* confer resistance to methicilln, as it can be explained by the incomplete regulator genes (*mecI* and/or *mecRI*) or inability to express *mecA* gene. Therefore, many isolates in the current study were susceptible to methicillin in antibiogram typing but possessed *mecA* gene. The discrepant results in our study could be explained by this mechanism as well. Therefore, the sensitivity of methicillin was 100% with specificity of 22.2%. The oxacillin resistance also expressed *mecA* gene. In this case, the sensitivity of oxacillin disk was 100% but with 20% only specificity. Erythromycin resistance in the isolates was encoded by *erm* and *msrA* genes. The erythromycin disk diffusion method showed sensitivity of 90% and specificity of 0% when compared with the PCR results for *erm* genes and sensitivity of 88.9% and specificity of 50% when compared with *msrA* gene.

Tube coagulase is one of the most reliable methods to identify *S. aureus*. There are 2 types of methods to detect the production of coagulase from *S. aureus*, tube coagulase test (TCT) and slide coagulase test (SCT). The SCT works by detecting the bound coagulase, which is also known as "clumping factor" that react directly to the fibrinogen in plasma, causing rapid cell agglutination. Negative SCT should reconfirm with TCT because they might produce extracellular coagulase. The extracellular coagulase detects a substance in the plasma known as coagulase reacting factor (CRF) to form a complex, which later reacts (clot formation) with the fibrinogen to form fibrin (form clot) [27].

In the current study, both human and rabbit plasma were used in the TCT. A previous study had showed that human plasma gives discordant results [43]. Rabbit plasma was the standard in performing the coagulase test. On the other hand, the current study reports that human and rabbit plasma give the same results. There were no difference in the TCT result using human and rabbit plasma. This might due to the fact that fresh human plasma was used. Both TCT using human and rabbit plasma gave the similar sensitivity and specificity, namely, 100% and 70%, respectively, as shown in Table 7. Three of the coagulase-negative isolates (30%) had *nuc* gene, indicating that some of the isolates were misidentified as CoNS. It was reported that these coagulase-negative *S. aureus* may probably react weakly or negatively with the TCT [27]. In our