

Purpose: To examine the potential usefulness of a high-brightness color liquid crystal display (LCD) monitor, the detectability of the color monitor was compared with the detectability of a monochrome LCD monitor by using receiver operating characteristic (ROC) analysis. **Materials and Method:** Two LCD monitors were used in this study: a two-megapixel high-brightness color monitor (RX-211, 750 cd/m² (maximum), Nanao, Japan), and a two-megapixel monochrome monitor (GS-220, 1,000 cd/m² (maximum), Nanao, Japan). Both monitors were calibrated to grayscale standard display function. We examined the detectability of a color LCD monitor with different luminance settings (500 and 170 cd/m²) and a monochrome LCD monitor (500 cd/m²). Totally, 40 images were taken – including 20 images with a ball (8 mm in diameter), which was used as a signal and put on the surface of a 15.5 cm acrylic plate. All images were acquired by use of a computed radiographic system (CR9000, Fuji Film, Japan). All images were displayed on the LCD monitors with 8-bit gray scale without any ambient lighting. Finally, the confidence data obtained by thirteen observers were analyzed by use of software (DBM MRMC, The University of Chicago) for ROC analysis, and the statistically significant differences between the areas under the ROC curve (AUC) were determined with the jackknife method. **Results:** The AUCs of color the LCD monitor with a maximum luminance of 500 cd/m², 170 cd/m² and monochrome LCD monitor with a maximum luminance of 500 cd/m² were 0.937, 0.924, and 0.915, respectively. There were no statistically significant differences between the monochrome LCD monitor and the color LCD monitor with different luminance settings. **Conclusion:** The detectability of a high-brightness color LCD monitor indicated comparable performances obtained with a monochrome LCD monitor.