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Title: The Effect of Using Double Gloves on Perforation in Orthopedic Surgery

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The randomized controlled experimental study was conducted between 30.11.2021 and 31.03.2022 in the Orthopedics and Traumatology operating room of a university hospital in western Turkey. The gloves used in the surgery were randomly divided into two groups (intervention: double glove group = 780 gloves, control: single glove group = 390). The presence of holes was checked by performing a water tightness test with the EN455-1 method on all gloves collected after the surgery by the researcher. Data were evaluated with descriptive statistics, Chi-square Test, Fisher Exact Test, Fisher Freeman Halton Test and linear model regression analysis (GLM for the Binomial Family Regression). Statistical significance was accepted as 0.05.

It was detected in 6.7% holes in the inner glove of the intervention group and 30.8% in the control group glove. There was a statistically significant difference between the groups in terms of glove puncture of the intervention group's inner glove and the control group. A statistically significant difference was determined between the groups in terms of the puncture status of the inner gloves ($\chi^2=37,229$, $p<0,001$). It was observed that there were 0.22 (0.12-0.38) times less holes in the gloves in the intervention group compared to the ones in the control group. When the nurse is referenced, the probability of having a hole in the non-dominant outer glove was found more 3.88 (1.89-7.97) times in surgeons, 4.39 (2.15-8.96) times in the first assistant, and 4.91 (2.35-10,26) times more in the second assistant. In surgeons, the probability of finding a hole in the nondominant inner glove was higher 6.51 (2.04-20.76) times, 7.74 (2.45-24.45) times in the first assistant and 10.66 (3.36-33,82) times in the second assistant. In the outer glove, the most common puncture was detected in the index finger (16.7%) of the nondominant glove. This was followed respectively by the dominant index finger (6.2%), nondominant middle finger (5.6%), nondominant thumb (4.6%), dominant thumb (4.1%) and nondominant palm (4.1%). It was found that the operating time and the use of plates, screws and rods during the operation affected the probability of perforation.

It was determined that the use of double gloves during surgery reduced puncture. It is recommended that team members use double gloves and change gloves at regular intervals during the surgery.