Research Report Summary

Lindsey Caldwell, M.D.; Timothy Brown, Ph.D.; Natalie Glass, Ph.D.
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Driving after Distal Radius Fractures

Distal radius fractures are a common orthopaedic injury, affecting over 640,000 people per year in the United States[1], and may account for 2.5% of emergency department visits[2]. The treatment for distal radius fractures may be operative or non-operative, but both treatment options require a period of immobilization to allow healing. Pain, stiffness, and weakness are invariably present after this fracture and typically improve gradually over time.

One of the most common questions orthopaedic surgeons are asked following a distal radius fracture is, "When can I drive?" Survey studies of physicians across multiple countries show a lack of standardization regarding recommendations, with little agreement regarding either criteria or timeframe for return to driving[3,4,5].

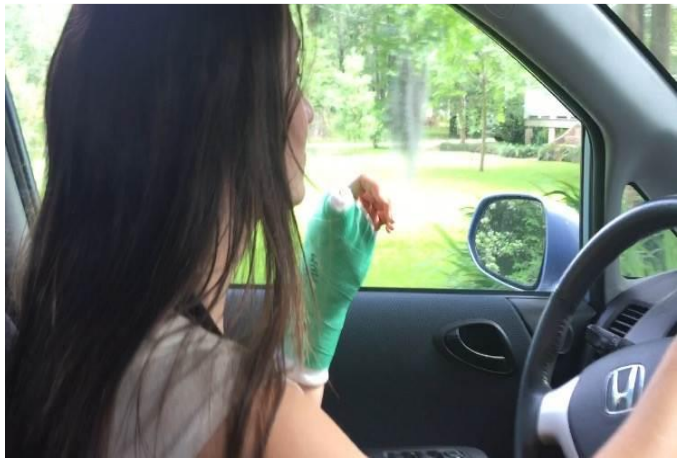

Photo: Sharon Ann Ourso, https://www.theodysseyonline.com/spending-summer-in-cast

The pilot study aimed to evaluate the effect of distal radius fracture on safety of roadway users, particularly drivers in passenger vehicles, and provide valuable information to physicians in counseling their patients

Distal Radius Fractures

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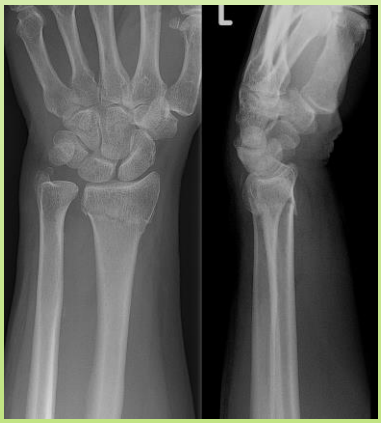

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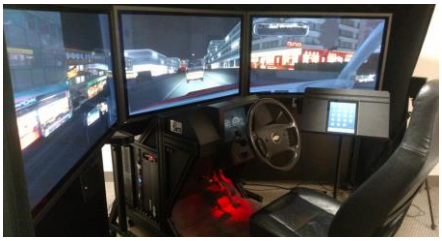
on return to safe driving. Subjects were evaluated at 2, 6, and 12 weeks post operatively. At post-op visits clinical data were obtained. These data included demographics (sex, age, hand dominance, laterality of distal radius fracture), splint usage, narcotic usage, and range of motion.



The driving simulation portion of the study occurred within 1 week of the post-operative clinic visits. The driving simulation used the miniSim research driving simulator. Each testing visit consisted of two separate driving scenarios preceded by a 5-minute practice drive. The first driving scenario included urban and rural driving environments that included curves and 90-degree turns. Some oncoming traffic was present, however, no traffic or pedestrian required the patient to change position or speed to avoid a crash. The second experimental drive involved a crash-imminent situation in which the driver had to rapidly change direction of travel to effectively respond to the event and avoid a crash.

Preliminary data from the first 4 fracture subjects and a control dataset (n=86) were analyzed. No differences in standard deviation of lane position were observed under any normal driving conditions. Average speed with respect to the speed limit in fractures compared with controls was significantly slower (p-values ranging 0.043-0.001 for urban and rural driving on curved or straight roads). However, fractures differed from controls in terms of the frequency (median: 1.23 vs 1.70, p=0.001) and speed (median: 2.12 vs 4.89 reversals per minute; p = 0.009) of steering inputs for a curving, urban road condition. Two weeks post-surgery, 3 out of 4 subjects failed to avoid the crash, with 1 not initiating a steering response and 2 not providing enough steering input to avoid the crash.

Preliminary results suggest patients 2 weeks after distal radius fracture volar plating are able to maintain lane position but with overall lower speed and fewer steering inputs, and with 75% (3 of 4) failing to avoid collision on a crash-avoidance task. With continued enrollment, a larger sample size will provide further insight into when distal radius fracture patients may safely return to driving.

References

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