More with less: A comparative kinematical analysis of Django Reinhardt’s adaptations to hand injury

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Abstract

Background: At the age of 18 years, jazz guitarist Django Reinhardt (1910–1953) sustained significant burns to his left-hand ring and little fingers; yet, subsequently, he relearned to play and achieved international fame, despite his injuries. Case description and methods: Archive film footage and novel motion analysis software were used to compare movements of Django’s fretting hand with that of six other guitarists of the same genre. Findings and outcomes: Django employed greater abduction of index and middle fingers (~9.11 ± 6.52° vs −5.78 ± 2.41°; p < 0.001) and more parallel alignment of fingers to the guitar neck (157.7 ± 3.37° vs 150.59 ± 2.67°; p < 0.001) compared to controls. Conclusion: In response to debilitating hand injury, Django developed quantifiable compensatory adaptation of function of his remaining functional fingers by developing an original playing technique.

Clinical relevance

Hand function following injury may be optimized by maximizing latent degrees of freedom in remaining digits, rather than through extensive surgical reconstruction or complex prostheses. Further study of adaptation strategies may inform prosthesis design.

Keywords

Guitar, kinematics, Django, Django Reinhardt

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Background

Jean-Baptiste “Django” Reinhardt (1910–1953) was the pioneering guitarist most responsible for the advent of the Gypsy Jazz genre. His first instrument was the violin, though he was a proficient guitarist by the age of 12. Django’s story is of exceptional clinical relevance on account of his attaining global acclaim for his technically masterful style of play, despite sustaining a debilitating burn injury to his fretting hand early in his career. Thus, Django provides a unique case study in high achievement despite disability. He remains an inspiration to both the international music community and to patients with compromised dexterity.

While Django’s biography and injury are well documented in the literature, there is scant insight into how Django adapted his playing technique following his injury. Although we can no longer evaluate him in a modern clinical setting, some (albeit previously limited) film footage of Django exists in circulation. Here, we analyze this film record frame by frame via an adapted two-dimensional (2D) motion tracking paradigm to measure the movement of the two active fingers on Django’s fretting hand during melodic play. Whereas there is no known film of Django pre-injury upon which to make comparisons, we make comparison to six other guitarists of similar skill and style. Here we ask, “how did Django do it?” We believe that the answer has implications for both clinical practice and prosthetic design.

Case description and methods

Case description

At the age of 18, Django suffered burns over 7%–15% of his body area following an accidental home fire. As a result of conservative wound management, he was left...