

How closely do surgeons follow gait analysis recommendations and why?

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Gait laboratory recommendations for surgery were compared with actual surgeries performed in 30 consecutive patients. The agreement between the procedures performed and those recommended by the gait laboratory averaged $93.2 \pm 13.4\%$ overall and $86.0 \pm 18.3\%$ excluding patients referred by the gait laboratory physician. For 23 patients (77%), the recommended surgeries exactly matched the surgeries ultimately performed. In the other patients, seven procedures that had not been recommended were performed, and seven procedures that had been recommended were not performed. Explanations for the differences included preoperative clinical or radiographic evaluation, intraoperative assessment, changes in function between gait analysis and surgery, and

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Introduction

Use of computerized gait analysis by orthopaedic surgeons has become increasingly widespread for evaluating patients with abnormal gait patterns [1–4]. The results of gait analysis tests provide additional information for the physician to use in surgical planning [2,4]. Previous studies have shown that this information significantly impacts surgical decision-making and the surgeries that are ultimately performed [1,4]. However, studies have not been done to examine how surgeons incorporate gait analysis data into surgical decision-making before and during surgery.

DeLuca *et al.* [1] demonstrated that the addition of gait analysis information can alter treatment plans in children with cerebral palsy. They found that surgical plans were changed following the addition of gait analysis data in 52% of the 91 patients they studied. Kay *et al.* [3] also found that surgical plans change significantly after consideration of gait analysis data. Treatment plans developed before gait analysis were altered in 62 of 70 patients (89%) after gait analysis. One hundred and ten procedures (1.6 per patient) that had not been planned prior to gait analysis were performed, and 106 procedures (1.5 per patient) that had been planned were not performed. However, some discrepancy was noted between the gait laboratory recommendations and the actual procedures performed; in fact, the full gait laboratory recommendations were followed in only 51% of the cases in that study.

The purpose of the current study is to understand the reasons underlying discrepancies between the surgeries

recommended based on gait analysis data and the surgeries actually performed. Specifically, this study investigates how closely gait analysis recommendations are followed as well as why some treatment recommendations are not followed.

Methods

Charts were retrospectively reviewed for 30 consecutive patients who underwent surgery from July 2002 to January 2003 following gait analysis within the prior 3 years at the authors institution. The mean age of these patients at surgery was 9.3 ± 3.1 years (range 5.1–15.3 years). The mean time between gait analysis and surgery was 5.5 ± 4.6 months (range 1.3–24.1 months). Twenty-nine patients had one gait study, and one had two gait studies, with only the later results being included in these data. Diagnoses of these patients included 23 with cerebral palsy, one with myelodysplasia, one with developmental delay, one with holoprosencephaly, one with a mitochondrial disorder, one with seizure disorder and autism, and two with bilateral clubfoot. The patients were referred for gait analysis by five different surgeons. The gait laboratory physician was the referring physician for 19 of the 30 patients.

Operative reports were compared with the preoperative gait laboratory reports to identify (a) any procedures that were performed but not recommended by the gait laboratory report and (b) any gait laboratory recommendations for surgery that were not performed by the surgeon. Procedures listed as possible recommendations on the gait analysis report were considered in agreement

6 months of their gait tests had 97% agreement between the surgeries performed and the gait analysis recommendations, compared with 82% agreement for those having surgery after more than 6 months had elapsed. This reflects the fact that gait analysis captures a patient's gait deviations at one point in time and that gait may change with growth in both able-bodied and physically-challenged children. Repeat gait analysis may therefore be needed if significant time has elapsed or if a patient has grown significantly since his or her gait test. Currently, physicians at the authors institution most commonly operate on children within 12 months of gait analysis.

The most common reason given for procedures that were recommended by the gait laboratory not being performed was reassessment intraoperatively after completing some of the recommended surgeries. In these cases, it was determined that the procedures already performed had adequately corrected the patients problems. Since gait tests are typically used for patients in need of multilevel surgery, it is understandable that some surgeries may not be needed if other surgeries correct the problems they are meant to address.

The frequency with which treating physicians followed recommendations based on gait laboratory examination is

encouraging. This study points out potential reasons for discrepancies between recommended and actual treatment following gait analysis. Additional studies to further explore these reasons could be important in understanding how gait analysis tests impact the treatment of patients with gait problems. This study was limited by a small sample size; a prospective study could alleviate the dependency on the referring physicians memory of the surgeries performed, allowing more patients to be studied over a longer time period. Because this study was based on the gait analysis laboratory recommendations at one center and includes a majority of subjects operated on by the gait laboratory physician, it is not clear to what extent the findings can be generalized. Despite these limitations, this study is the first to demonstrate some important aspects of the decisions surgeons make when considering gait laboratory recommendations.

References

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