

Chapter 6

Computer-Assisted Analysis of Myelography

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ABSTRACT

Myelography, dating back to the 1920s, injects contrast into the spinal canal to diagnose spinal conditions. Evolving with technology, it now utilizes CT and safer contrast agents. Still valuable, it aids in detecting CSF leaks, cervical root avulsion, and cases where MRI is impractical, providing dynamic imaging for precise diagnosis in specific clinical situations. Computer-assisted analysis plays a significant role in the field of myelography, where advanced technologies like machine learning, computer vision, and artificial intelligence (AI) are increasingly being integrated for enhanced image interpretation and diagnosis. These technologies offer the potential to revolutionize the way myelography is performed and analyzed, leading to improved patient care, disease detection and medical advancements.

INTRODUCTION

This section covers an introduction to myelography, its techniques and importance. Further, it delves into the computer-assisted techniques that enable better analysis of myelography images, and detection of spine diseases and disorders.

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MYELOGRAPHY

Myelography, introduced by Sicard and Forestier in 1921, gained widespread adoption by the late 1920s, initially employing Lipiodol and later Pantopaque as contrast agents. Administered intrathecally, the contrast agents underwent suction withdrawal, evolving over time with the advent of computed tomography (CT) and water-soluble non-ionic contrast agents in the 1970s and 1980s, enhancing its safety and diagnostic accuracy (Gilcrease-Garcia et al., 2018).

Despite the fact that traditional myelography has mostly been replaced by MRI and, to a lesser extent, CT, it still serves as a useful diagnostic tool in certain scenarios. (Bolender, Schönström, and Spengler, 1985).

- Spondylosis: For patients who cannot undergo MRI, myelography aids in evaluating spinal degeneration.
- Spontaneous Intracranial Hypotension: Identifying the cause.
- Other Complex Cases: When routine CT or MRI cannot provide a definitive answer.

Combining myelography with CT enhances its reliability, particularly in lumbar surgery planning. Dynamic imaging sequences further underscore its relevance, emphasizing its enduring role as a diagnostic tool in selected circumstances (Ozdoba et al., 2011).

Figure 1. Conventional Myelography (Gilcrease-Garcia et al., 2018)



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