Gallie fusion

(C1-C2 Wiring and Bone Graft)

Uses sublaminar wiring with a bone graft (often from the iliac crest).

Requires external immobilization (e.g., halo or rigid collar).

Less commonly used due to lower biomechanical stability.

The Gallie fusion is a surgical technique developed to stabilize the atlantoaxial joint, which is the articulation between the first cervical vertebra (C1 or atlas) and the second cervical vertebra (C2 or axis). This procedure is often employed to address conditions such as atlantoaxial instability resulting from trauma, congenital anomalies, or degenerative diseases.

Procedure Overview: In the Gallie fusion technique, a bone graft is positioned over the posterior arches of the C1 and C2 vertebrae. Stainless steel wires are then looped beneath the posterior arch of C1 and around the spinous process of C2 to secure the bone graft in place, promoting fusion between these vertebrae. ResearchGate

Limitations: While the Gallie fusion provides stabilization, it has been noted to offer limited rotational stability. This limitation has led to modifications and the development of alternative techniques to enhance fusion rates and overall stability.

Alternative Techniques: To improve outcomes, other surgical methods have been introduced:

Brooks and Jenkins Technique: This modification involves placing two separate bone grafts between the posterior elements of C1 and C2 on each side, secured with sublaminar wires. This approach enhances rotational stability compared to the original Gallie technique.

Transarticular Screw Fixation: Developed by Magerl and Seemann, this method employs screws inserted across the C1-C2 joint, providing robust stability and higher fusion rates. However, it requires careful preoperative planning due to anatomical variations and potential risks to the vertebral artery. London brain and spine surgeon

C1 Lateral Mass and C2 Pedicle Screw Fixation (Harms Technique): Introduced by Harms and Melcher, this technique uses screws in the lateral mass of C1 and the pedicle of C2, connected by rods. It offers strong fixation and has become a widely accepted method for C1-C2 fusion.

Each surgical approach has its own set of indications, advantages, and potential complications. The choice of technique is determined by the patient's specific pathology, anatomical considerations, and the surgeon's expertise.

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