

# Arthroscopy Versus Arthrocentesis for Treating Internal Derangements of the Temporomandibular Joint

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## KEYWORDS

• Internal derangement • Arthroscopy • Arthrocentesis • Disc displacement • Complications

## KEY POINTS

- In treating internal derangements of the temporomandibular joint, re-establishing joint mobility is more important than restoring disc position.
- It is not necessary to visualize the joint to successfully treat internal derangements.
- Arthrocentesis is as effective as arthroscopy in treating internal derangements.
- Arthrocentesis has fewer and less serious complications.

Prior to the early 1970s, the surgical treatment of internal derangements of the temporomandibular joint (TMJ) involved either restoration of the intra-articular disc to its normal position (discoplasty) or removal of the disc (discectomy). However, the introduction of arthroscopic surgery for the management of internal derangements by Ohnishi in 1975<sup>1</sup> and the subsequent development of the technique by Murakami and Ito<sup>2</sup> in Japan and Sanders in the United States<sup>3</sup> represented a major advancement in the treatment of such conditions, because it involved a less invasive approach. Although initially this procedure consisted mainly of irrigation of the joint and the breaking up of adhesions (lysis and lavage), various surgical manipulations similar those performed arthroscopically in other joints were subsequently introduced by some surgeons. It soon became evident that in the treatment of patients with internal derangements, restoring joint mobility rather than disc position was the important factor. This produced a better distribution of forces within the joint, allowed more physiologic function by improving

the diffusion of nutrients and the elimination of inflammatory breakdown products, and ultimately resulted in transformation of the painful anteriorly displaced retrodiscal tissue into a more fibrotic functional pseudodisc.<sup>4</sup>

The success reported with arthroscopic management of internal derangements ultimately led to the introduction of arthrocentesis for the treatment of closed lock in the TMJ by Nitzen, Dolwick and Martinez in 1991.<sup>5</sup> This procedure involved lavage of the TMJ via 2 hypodermic needles introduced into the upper joint space and lysis of adhesions hydraulically and by manual manipulation of the mandible. Subsequently, the procedure was also reported to have been used successfully for the treatment of painful TMJ clicking<sup>6</sup> and TMJ osteoarthritis<sup>7</sup> and rheumatoid arthritis.<sup>8</sup>

However, because arthrocentesis does not involve visualization of the joint structures or the use of additional surgical manipulations, it raises the question of whether arthroscopy should be the preferred initial treatment for internal derangements of the TMJ. Because reports on other

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conditions for which arthroscopic surgery and arthrocentesis have been used are limited, this discussion will focus only on internal derangements, comparing both individual studies and those in which both procedures were used by the same surgeons. Because some arthroscopic studies involved only lysis and lavage and others involved lysis and lavage plus such procedures as joint debridement, abrasion arthroplasty, lateral capsular release, lateral pterygoid muscle detachment, and disc repositioning, these 2 groups will also be compared.

### ARTHROSCOPY VERSUS ARTHROCENTESIS IN SEPARATE STUDIES

There have been numerous studies in which internal derangements have been treated either arthroscopically or by arthrocentesis. An extensive review of arthroscopic surgery was reported by Israel in 1999,<sup>9</sup> which involved data from 11 studies published between 1987 and 1996. Although most of the 3955 patients had nonreducing anterior disc displacement, some had only clicking. Arthroscopic lysis with lavage was the most frequent procedure, but some patients were also treated with various surgical manipulations. The results showed a mean success rate of 84%, with an average increase in maximum mouth opening of 10.4 mm and 82% of patients reporting less pain. Similar results have been reported by Alvarez and colleagues<sup>10</sup> (61 patients, 4-year follow-up, 81.4% success), Murakami and colleagues<sup>11</sup> (33 patients, 10-year follow-up, 83.8% success), Sorel and Piecuch<sup>12</sup> (22 patients, 2 to 10.8-year follow-up, 91% success), and White<sup>13</sup> (66 patients, 8-year follow-up, 76% success). The average success rate for these 5 studies is 83%.

The long-term effectiveness of arthrocentesis was reported to be 85% by Frost and colleagues<sup>14</sup> (40 patients, 14-month follow-up). Nitzen, Samson, and Better<sup>15</sup> reported a 95% success rate, whereas Hosaka and colleagues<sup>16</sup> reported 79% success (20 patients, 3-year follow-up), and Carvajal and Laskin<sup>17</sup> had an 88% success rate (26 patients, 49 months). The mean success rate for these 4 studies is 87%. In a review of 14 articles from the international literature, Al-Belasy and Dolwick<sup>18</sup> found an 83.2% success rate. Thus, based on individual studies, arthrocentesis is as effective as arthroscopy for the treatment of internal derangements.

### ARTHROSCOPY VERSUS ARTHROCENTESIS IN THE SAME STUDIES

Because of the possible variations in individual studies, as well as the greater potential for bias,

they are not as reliable as comparative studies done at a single institution. A review of the literature revealed 2 such early studies<sup>19,20</sup> that should arthroscopy to be somewhat better, but since that time 5 studies<sup>21-25</sup> in which this type of comparison was made, showed no significant difference (Table 1).

### DISCUSSION

The results of the preceding comparisons provide strong evidence that the 2 procedures are comparable in effectiveness. However, it has been claimed that arthroscopic surgery has the advantage of allowing the surgeon to look into the joint and directly treat any pathology that exists. To address this issue, one needs to compare the results from studies on arthroscopic lysis and lavage alone with studies on lysis and lavage plus other surgical maneuvers reported in the literature. Table 2 shows that there is no significant difference. Moreover, in 2 comparison studies of arthroscopic lysis and lavage with lysis and lavage plus arthroscopic surgery from the same institution by Gonzalez-Garcia and colleagues,<sup>31,32</sup> no statistical difference was noted. Thus, if lysis with lavage alone is effective, it is not necessary to look into the joint, and arthrocentesis can be the initial treatment for internal derangements.

Other advantages of arthrocentesis include less invasiveness, no need for special instruments, less postoperative morbidity, lower cost, and low potential for complications. The numerous complications of arthroscopic surgery are listed in Box 1.<sup>33</sup> The only significant complication of arthrocentesis has been 1 case of an extradural hematoma.<sup>34</sup>

The successful management of patients with close lock using arthrocentesis, despite the fact that the intra-articular disc is still in an anteriorly

**Table 1**  
Success of arthroscopy and arthrocentesis compared in the same study

Author	Arthroscopy Arthrocentesis
Kropmans et al, <sup>21</sup> 1999	No significant difference
Goudot et al, <sup>22</sup> 2000	No significant difference
Sanroman, <sup>23</sup> 2004	No significant difference
Hobeich et al, <sup>24</sup> 2007	No significant difference
Tan & Krishnaswamy, <sup>25</sup> 2012	No significant difference

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