

## 구심로 차단 동통에서의 미세 후근 진입부 절제술

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= Abstract =

### Microsurgical DREZotomy for Deafferentation Pain

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**O**bjective : DREZotomy is effective for the treatment of deafferentation pain as a consequence of root avulsion, postparaplegic pain, posttraumatic syrinx, postherpetic neuralgia, spinal cord injury, and peripheral nerve injury. We performed microsurgical DREZotomy to the patients with deafferentation pain and relieved pain without any serious complication. The purpose of this study is to evaluate the usefulness of the microsurgical DREZotomy for deafferentation pain.

**Methods** : We evaluated 4 patients with deafferentation pain who were intractable to medical therapy. Two of them were brachial plexus injury with root avulsion owing to trauma, one was axillary metastasis of the squamous cell carcinoma of the left forearm, and the last was anesthesia dolorosa after surgical treatment(MVD and rhizotomy) of trigeminal neuralgia. Preoperative evaluation was based on the neurologic examination, radiologic imaging, and electrophysiological study. In the case of anesthesia dolorosa, we produced two parallel lesions in cephalocaudal direction, 2mm in distance, from the C2 dorsal rootlet to the 5mm superior to the obex including nucleus caudalis, after suboccipital craniectomy and C1 - 2 laminectomy, with use of microelectrode. In the others, we confirmed lesion site with identification of the nerve root after hemilaminectomy. We performed arachnoid dissection along the posterolateral sulcus and made lesion with microsurgical knife and microelectrocoagulation, 2mm in depth, 2mm in distance, to the direction of 30 - 45 degrees in the medial portion of the Lissauer's tract and the most dorsal layers of the posterior horn at the one root level above and below the lesion.

**Results** : Compared with preoperative state, microsurgical DREZotomy significantly diminished dosage of the drugs and relieved pain meaningfully. One patient showed transient ipsilateral ataxia, but recovered soon. There was not any serious complication.

**Conclusion** : It may be concluded that microsurgical DREZotomy is very useful and safe therapeutic modality for deafferentation pain, especially segmentally distributed intermittent or evoke pain. Complete preoperative evaluation and proper selection of the patients and lesion making device are needed to improve the result.

**KEY WORDS** : Microsurgical DREZotomy(MDT) · Dorsal root entry zone(DREZ) · Deafferentation pain · Nucleus caudalis · Posterior horn · Posterolateral sulcus.

서 론

1960

1972 Sindou, 1976 Nashold

(Table 1).

6)17)23)28)30)

대상 및 방법

1999 1 2001 2 가

1. 증 례

1) Case I  
80  
40  
20  
가

2) Case II  
48 40 3 1  
3 가 7

3) Case III  
54  
41  
9  
1 : 1, 58.7 (48~80), 16 (1~41), 8.2 (7 ~20 )

4) Case IV  
53  
10 5 3  
28)

(Vas score) 가

**Table 1.** Clinical summary

	Case	Case	Case	Case
Age/sex	80/M	48/M	54/F	53/F
Dx	Brachial plexus injury with root avulsion	Axillary metastasis of SCC of Lt. arm	Brachial plexus injury	Anesthesia dolorosa
Interval	20 yr	1 yr	2 yr	41 yr
Interval	20 yr	7 month	3 yr	9 yr
Pain nature	Evoked	Steady	Intermittent	Intermittent
Distribution	C5, 6, 7	Nondermatomal distribution t1-maximal	C4, 5	V2, 3
Preop. Vas score	10	10	9	9
Postop. Vas score	2	5	1	1
Operation	MDT C4-7	MDT C7-T4	MDT C3-5	Caudalis DREZ
Complication	Ipsilateral ataxia	Death from septic shock		

SCC : squamous cell carcinoma

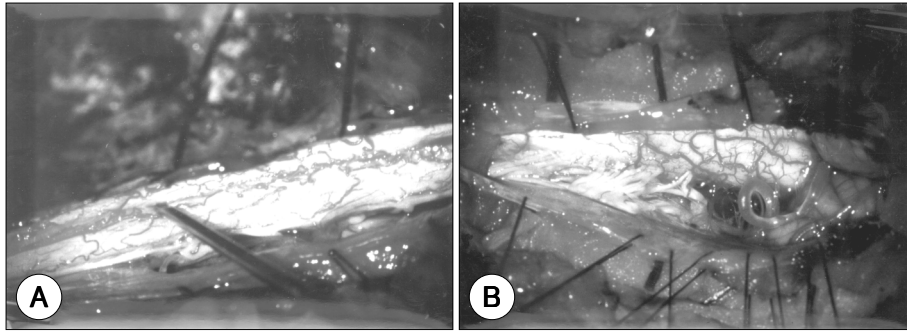
interval : time interval between injury and onset of symptom

interval : time interval between onset of symptom and operation

intermittent : shooting, lancinating

steady : causalgia, dysesthesia

evoked : allodynia, hyperpathia, hyperesthesia



**Fig. 1.** Operative field. MDT for root avulsion. Dorsal rootlets are avulsed (arrow) and ventral roots are preserved (A). Operative field of caudalis DREZ. DREZotomy was performed on the dotted line (B).

**2. 수 술**

concorde position  
level  
(hemilaminectomy)

(posterolateral sulcus)  
가 2mm  
(Lissauer's tract)  
30~45  
(dorsalmost layers)  
(short  
(Fig. 1).  
5  
3  
5  
NSAID  
가  
고 찰  
obex 2mm  
, obex 5mm 3mm  
2mm  
75 15  
3 30  
(head elevation) 5  
pathway)  
Rexed's lamina , , &  
12).

**결 과**

Vas score

Vas score 5  
8

(reorganization)가  
가 가  
(firing)가

(large caliber sensory fiber) like - material)  
<sup>11)</sup> Edgar <sup>7)</sup>  
<sup>12)</sup><sup>13)</sup><sup>15)</sup><sup>17)</sup><sup>22)</sup> 4가 (Table 2).  
substance P, somatostatin, non - DREZ mechanism  
methionin - enkephalin sub-  
stance P가 somatostatin  
methionin - enkephalin  
<sup>3)</sup><sup>11)</sup> , , , <sup>6)</sup><sup>19)</sup><sup>27)</sup>  
Rexed 's layer -  
<sup>27)</sup>  
(interruption)  
<sup>13)</sup><sup>17)</sup> 가  
54~82% <sup>10)</sup><sup>18)</sup><sup>20)</sup><sup>21)</sup><sup>25)</sup> . Nashold <sup>19)</sup>  
<sup>4)</sup>  
(sulcomyelotomy)  
<sup>7)</sup>  
가 MRI가  
가 MRI  
. Martens <sup>15)</sup>  
2 25.5 , 8  
<sup>28)</sup><sup>29)</sup> 40 ,  
MRI  
Vas score가 8  
Vas score 가 <sup>20)</sup> ,  
5 . Zeidman<sup>30)</sup>  
<sup>23)</sup>  
Rath <sup>20)</sup> 15~29%  
(beta - endorphin -

**Table 2.** Factors that cause the failure of MDT

Factors
Inadequate thermal lesion
Inadequate lesion placement
Improper selection of the patient
Deafferentation pain from other non-DREZ mechanism

**Table 3.** Prognostic factors of MDT

Good	Poor
Caudally extended pain from the level of the injury	Associated spinal cord cyst
Well localized cancer pain	Elevated beta-endorphin-like-material in csf
Unilateral and dermatomally distributed pain	Permanent p1 latency in sep monitoring
Root avulsion	

**Table 4.** Good prognostic factors of caudalis DREZ

Factors
Lesser preoperative sensory deficit
Restricted to trigeminal distribution
Pain nature --- intermittent, evoked

**Table 5.** Factors that cause facial pain

Factors
Refractory trigeminal neuralgia
Postsurgical anesthesia dolorosa
Postherpetic neuralgia
Cancer related pain
Multiple sclerosis
Vascular - stem infarct, AVM
Atypical facial pain

6) 가 P1 latency가

15) 가

(Table 3).

4)24) 가

가

(Table 4, 5).

가

1

4)2)

1)4) 가

결과

가

• : 2001 7 3

• : 2001 10 10

• : 150 - 713 62

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