EXPERIMENTAL STUDY

Anatomical variations of intercostobrachial nerve: A potential candidate for neurotization after traumatic median nerve injury?

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ABSTRACT

BACKGROUND: This study focused on the anatomical characteristics and variations of intercostobrachial (ICBN) nerve and median nerve to investigate the possible use of ICBN in restoration of sensory damage of hand after traumatic median nerve injury and to evaluate the feasibility of ICBN neurotization to median nerve.

METHODS: Variations of ICBN were noted in 16 axillary region dissections of eight cadavers. Measurements for ICBN's suitability in terms of neurotization to brachial plexus were done with millimetric devices. The distance of ICBN to the distal end of the lateral (LCMN) and medial (MCMN) contributions of the median nerve and the diameters of ICBN, LCMN, and MCMN were measured.

RESULTS: Fifteen axillary dissections exhibited ICBN, whereas it was absent on the left side of one of the cadavers. The mean diameter of ICBN at its origin was 2.0±0.7 mm and the mean diameter of ICBN at its coaptation point was 3.1±0.9 mm. The mean diameter of the LCMN was 3.9±2.0 mm, the mean diameter of MCMN was 3.5±0.9 mm. The length of ICBN was found to be adequate at both 45 and 90° of shoulder abduction to be extended to both LCMN and MCMN. The diameters of LCMN and MCMN were not significantly correlated with the diameter of ICBN both at origin and at coaptation point (LCMN: p=0.55–0.63 and MCMN: p=0.89–0.85). There is no significant difference between the diameter of LCMN and the diameter of ICBN at its coaptation point (p=0.168) and also between the diameter of MCMN and the diameter of ICBN at its coaptation point (p=0.232).

CONCLUSION: All ICBNs dissected showed adequate length to reach the lateral and medial contribution of the median nerve directly. The ICBN could be a feasible candidate since its diameter was close to LCMN and MCMN according to the descriptive and inferential statistics.

Keywords: Anatomy; cadaver; intercostobrachial nerve; median nerve; nerve transfer; neurotization.

INTRODUCTION

Median nerve damage is a common occurrence, especially after brachial plexus injury. Treatment of brachial plexus damage is a difficult process for surgeons.[1,2] In addition to the recovery of the motor deficit, the recovery of the sensory deficit of the hand is a vital issue. Complete brachial plexus injuries are seen especially due to high-energy traumas, and the avulsion of lateral or medial contribution of median nerve can also occur. Glenohumeral joint dislocation is another cause of those injuries. The lateral (LCMN) and medial (MCMN) contribution of the median nerve have diverse motor and sensory functions some of which are vital.

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The typical intercostal nerves give off five branches which are collateral branches, muscular branches, pleural branches, lateral cutaneous branches, and anterior cutaneous branches. The lateral cutaneous branch of the second intercostal nerve has a special name called as ICBN nerve.[3] Various reports analyzed the possible use of ICBN nerve for median nerve neurotization and claimed that transfer of the ICBN to LCMN is anatomically feasible and can be used for the restoration of sensory defect in complete brachial plexus injuries.[2–6] The ICBN nerve passes through the axilla by piercing the intercostal muscles and the serratus anterior muscle in the midaxillary line providing the sensation of the posterior part of the axilla. It travels along the posteromedial border providing skin sensation in this area before passing to the upper arm.[7,8] Continuing along the posteromedial border of the arm, the skin innervation of the region is ensured. This study was planned to determine the anatomical characteristics and variations of the ICBN nerve and median nerve to investigate the possible use of ICBN in the restoration of sensory damage after traumatic median nerve injury and to evaluate the feasibility of neurotization of ICBN to the median nerve.

MATERIALS AND METHODS

After obtaining the approval of the Institutional Ethics Committee, 16 axillary region dissections of eight cadavers were performed by an anatomist and two orthopedic surgeons. Variations of the ICBN were noted. The measurements were made with a digital compass (Shan Company, China). The distances of the ICBN to the distal end of the LCMN and MCMN were measured. Its suitability in terms of neurotization was evaluated after dimensional measurements. Cadavers that have not undergone surgical procedures from the axillary area were included in the study. The exclusion criteria were history of surgery from the axillary region, upper extremity deformities, and the absence of ICBN. As a fixing procedure, special diluted formaldehyde solutions were utilized. In the cadaveric dissection, the skin was removed first, and then the subcutaneous tissue was removed at the chest region. Then, the pectoral muscles with their fascia were removed and the ICBNs were dissected at the level of the second rib. Afterward, the axillary dissections were performed and the median nerves were reached. Some photos from the dissections were used to illustrate the dissections and elucidate the measurements (Figs. 1–3).

After 16 consecutive axillary region dissections of eight cadavers involving the right and the left sides, the number of branches at the ICBN nerve origin and the total number of branches of ICBN were determined. The diameters at the ICBN nerve origin, the diameters at the ICBN nerve coaptation point, the distance between the origin and the branching point of ICBN, the distance between the origin of ICBN and the skin, the distance between ICBN and the distal end of the LCMN and MCMN at 45° of abducted shoulder, and the distance between ICBN and the distal end of the LCMN

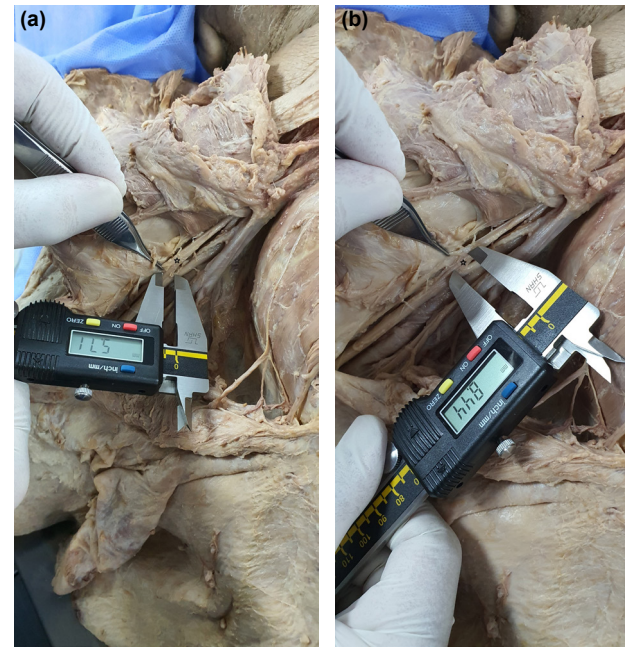

Figure 1. (a) The measurement of the diameter of the LCMN. **(b)** The measurement of the length of the LCMN. LCMN is marked with a black star.

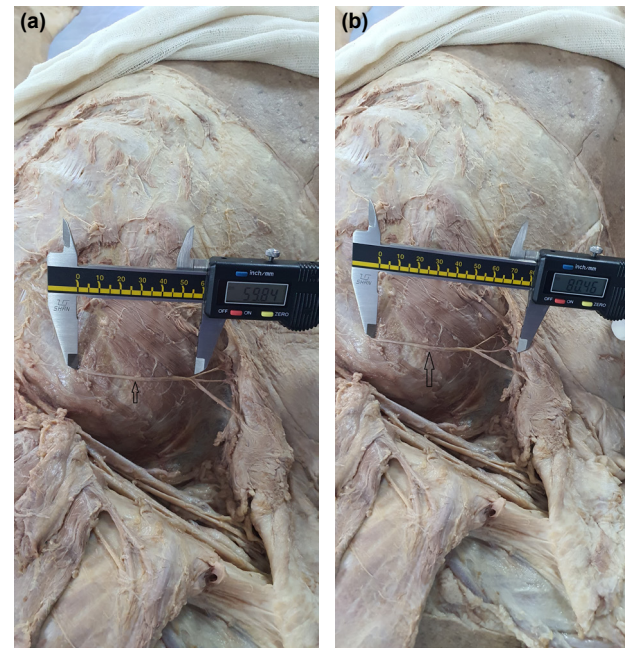

Figure 2. (a) The measurement of the distance between the origin and the branching point of ICBN. **(b)** The measurement of the distance between the ICBN origin and the skin. ICBN is shown with a black arrow.

and MCMN at 90° of the abducted shoulder were measured. Diameters and lengths of LCMN and MCMN were also measured.

Descriptive statistics are provided as average, maximum, minimum, and standard deviation values. Statistical analyses were made with SPSS version 26.0.0 software program. Shapiro–

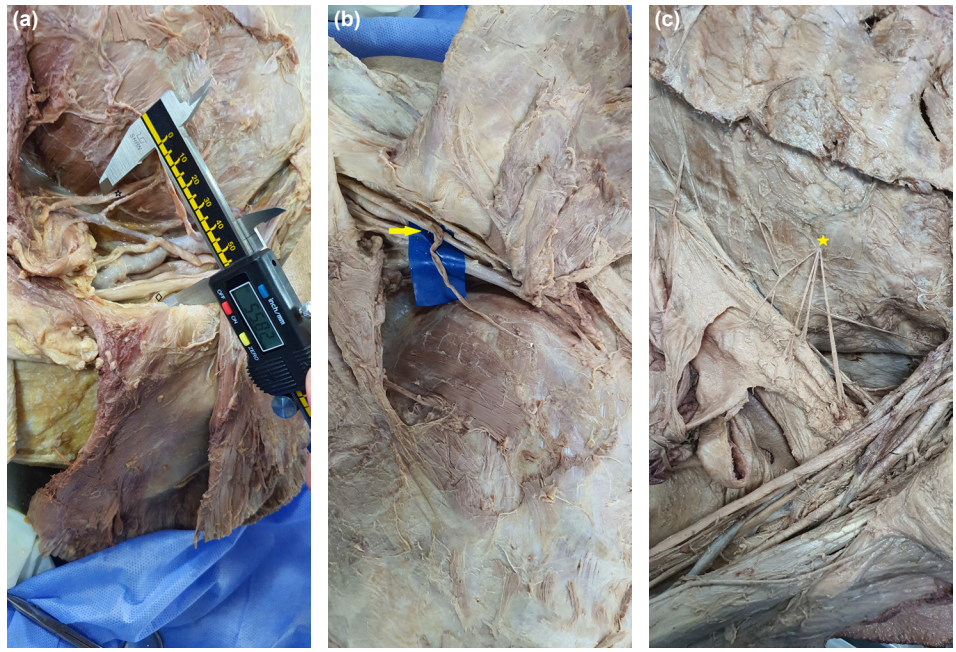

Figure 3. (a) The measurement of the distance between ICBN and LCMN. ICBN is marked with a black star and LCMN is marked with a black square. **(b)** The neurotization of the ICBN to the LCMN in the cadaver. The neurotization was done by bringing the coaptation points of both the ICBN and LCMN end to end. Yellow arrow shows the neurotization point. **(c)** The lateral cutaneous branch of the left third intercostal nerve was divided into four branches at the nerve origin. The thick upper branch had a similar course to the ICBN which was absent in this cadaver. Yellow star shows the branching point of third intercostal nerve.

Wilk test was performed to test normality of data and it indicated normal distribution. The paired t-test was used to compare the average values and Pearson correlation was used to assess possible correlations.

RESULTS

Out of eight cadavers, seven were male and one was female with a mean height, weight, and age of 171±14 cm, 74±12 kg, and 58 years (range 29–78), respectively. During the 16 axillary dissection, the intercostobrachial nerve was present in all sides except for one (Fig. 3c). While 13 ICBNs (86.67%) were single trunk at their origins, one ICBN had two branches, and one had three branches at the nerve origin. The mean number of total ICBN branches was 2.5±0.6. It pierced the serratus anterior muscle in 15 axillary dissections before emerging under the second rib. Tables 1–3 provides all measurements and average values. Table 4 provides the correlation statistics and Table 5 provides the paired sample t-test statistics.

The mean diameter of ICBN at its origin was 2.0±0.7 mm and the mean diameter of ICBN at the point of its coaptation was 3.1±0.9 mm. The mean diameter of the LCMN was 3.9±2.0 mm (Fig. 1a), the mean length of LCMN was 24.1±13.6 mm (Fig. 1b), the mean diameter of the MCMN was 3.5±0.9 mm, and the mean length of MCMN was 33.5±17.4 mm. While the mean diameter of LCMN was larger than MCMN, the mean length of LCMN was shorter than the length of MCMN.

The mean distance between the origin and the branching point of ICBN was 36.9±18.2 mm (Fig. 2a) and the mean distance between the origin and the supplied skin was 79.2±15.5 mm (Fig. 2b). The average distance between ICBN and LCMN at 45-degree shoulder abduction was 54.6±6.3 mm and the average distance between ICBN and LCMN at 90° shoulder abduction was 63.4±6.5 mm (Fig. 3a). All the ICBNs dissected showed adequate length to reach the LCMN directly. In other

Table 1. Gender, body height and the status of presence of ICBN of the cadavers

Cadaver number	Gender	Body height (cm)	Status of ICBN
1	Male	166	Present bilaterally
2	Male	183	No ICBN on the left side
3	Male	146	Present bilaterally
4	Male	194	Present bilaterally
5	Female	163	Present bilaterally
6	Male	172	Present bilaterally
7	Male	170	Present bilaterally
8	Male	174	Present bilaterally

*ICBN: Intercostobrachial nerve.

Table 2. Measurements of lateral and medial cord contributions of the median nerve

Cadaver number	Side of the dissection	Diameter of LCMN (mm)	Length of LCMN (mm)	Diameter of MCMN (mm)	Length of MCMN (mm)
1	Right	2.9	13.0	4.0	18.2
1	Left	3.6	28.0	2.8	26.6
2	Right	2.4	31.2	2.6	18.7
3	Right	2.0	17.2	2.2	37.7
3	Left	3.3	42.7	3.6	50.0
4	Right	4.5	14.5	3.4	20.9
4	Left	3.2	15.5	4.2	22.0
5	Right	2.1	20.0	2.3	30.0
5	Left	2.3	28.8	2.6	35.5
6	Right	3.4	48.0	2.8	86.3
6	Left	10.1	8.9	3.9	40.0
7	Right	3.7	45.3	4.1	39.8
7	Left	4.7	31.2	3.8	19.4
8	Right	5.7	8.5	5.3	29.6
8	Left	5.1	8.1	4.5	28.0
Minimum	2.0	8.1	2.2	18.2	
Maximum	10.1	48.0	5.3	86.3	
Average	3.9	24.1	3.5	33.5	
Standard deviation	2.0	13.6	0.9	17.4	

LCMN: Lateral contribution of the median nerve; MCMN: Medial contribution of the median nerve.

words, the ICBN could extend to both LCMN and MCMN (Fig. 3b).

Paired samples t-test comparison of LCMN diameter and ICBN diameter at its origin showed that there was a significant difference (p=0.004). The diameter of MCMN and the diameter of ICBN at its origin were also significantly different (p=0.0001). The diameter of ICBN at its origin differed significantly from the diameter of ICBN at its coaptation point (p=0.0001). The length of the LCMN differed significantly from the length of the MCMN (p=0.025). There was no significant difference between the diameter of LCMN and the diameter of ICBN at its coaptation point (p=0.168), and also between the diameter of MCMN and the diameter of ICBN at its coaptation point (p=0.232). In addition, the diameter of LCMN and MCMN was also similar (p=0.302). The distances between the ICBN origin and both the branching point and the skin were significantly longer from the distance between ICBN and LCMN at both 45° and 90° shoulder abduction indicating that ICBN had an adaquate length to reach the LCMN (p=0.001 and p=0.0001) (Table 5).

The height of the cadaver was positively and significantly correlated with the distance between ICBN and LCMN at both 45° and 90° shoulder abduction (p=0.0001) (r=0.855). The diameter and length of the LCMN were positively correlated with the diameter and length of the MCMN (p=0.03) (r=0.55). The diameters of the LCMN and MCMN were not significantly correlated with the diameter of ICBN both at the origin and at the coaptation point (LCMN: p=0.55–0.63 and MCMN: p=0.89–0.85) (Table 4).

DISCUSSION

This study aimed to reveal the variations of ICBN and median nerve and to analyze the feasibility of the ICBN to the LCMN and MCMN, as the patients with sensory loss in hand due to brachial plexus avulsion injuries end up with secondary repetitive injuries such as burns and cuts.[5,9] Being possibly the largest sensory nerve in the body,[10] the ICBN is a major candidate for the sensory reconstruction of the hand since the sensory reconstruction with intercostal and supraclavicular nerves can provide only limited sensory recovery of the hand[4,11–13] and ICBN's cortical topography is closer to the hand area than that of the other potential donors.[2]

Out of 16 axillary dissections, 93.75% showed ICBN, whereas in 6.25%, it was absent. In some studies, it has been stated that the absence of ICBN reached up to the 6%[14–16] similar to our study. Out of 15 axillary dissections in our study, 13 ICBNs (86.67%) were single trunk at their origins, 1 ICBN (6.66%) had two branches, and 1 (6.66%) had three branches

Table 3. Measurements of intercostobrachial nerve

Cadaver number	Side of the dissection	Diameter of ICBN* at origin (mm)	Diameter of ICBN at coaptation point (mm)	Number of branches of ICBN at origin	Total number of ICBN branches	The distance between the origin and the branching point of ICBN (mm)	The distance between the ICBN origin and the skin (mm)	The distance between ICBN and LCMN at 45 degree shoulder abduction (mm)	The distance between ICBN and LCMN at 90 degree shoulder abduction (mm)
1	Right	2.4	3.6	1	3	71.0	94.2	50.1	57.4
1	Left	2.4	3.7	1	2	39.2	76.4	52.2	60.1
2	Right	1.9	3.1	1	4	34.9	71.8	61.8	70.0
3	Right	1.7	2.5	1	2	19.0	61.1	44.1	53.5
3	Left	1.6	2.2	1	3	20.3	62.0	48.7	57.1
4	Right	2.3	3.8	1	2	68.7	85.3	68.2	77.4
4	Left	2.3	3.3	1	2	13.1	72.6	60.3	68.9
5	Right	2.1	3.4	1	3	26.8	59.1	50.1	58.3
5	Left	2.9	4.1	1	2	18.3	66.9	52.9	60.0
6	Right	1.1	1.9	1	2	35.1	98.3	58.7	68.7
6	Left	1.4	2.3	3	2	43.7	93.9	53.3	64.4
7	Right	1.0	1.8	2	3	23.4	74.8	58.0	66.6
7	Left	1.1	1.9	1	3	42.4	114.2	49.9	59.8
8	Right	1.9	3.1	1	3	59.8	80.5	59.2	69.0
8	Left	3.6	5.1	1	2	37.4	77.5	51.1	60.1
Minimum		1.0	1.8	1	2	13.1	59.1	44.1	53.5
Maximum		3.6	5.1	3	4	71.0	114.2	68.2	77.4
Average		2.0	3.1	1.2	2.5	36.9	79.2	54.6	63.4
Standard deviation		0.7	0.9	0.6	0.6	18.2	15.5	6.3	6.5

ICBN: Intercostobrachial nerve.

Table 4. The statistical correlation analysis of mean values

Variable 1	Variable 2	p-value	Correlation coefficient
Cadaver height	ICBN-LCMN distance at 45° shoulder abduction	0.0001	0.855**
Cadaver height	ICBN-LCMN distance at 90° shoulder abduction	0.0001	0.853**
LCMN diameter	MCMN diameter	0.033	0.551*
LCMN length	MCMN length	0.024	0.578*
LCMN diameter	ICBN origin diameter	0.558	0.165
LCMN diameter	ICBN coaptation point diameter	0.631	-0.135
MCMN diameter	ICBN origin diameter	0.892	0.038
MCMN diameter	ICBN coaptation point diameter	0.856	0.151

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed). LCMN: Lateral contribution of the median nerve; MCMN: Medial contribution of the median nerve; ICBN: Intercostobrachial nerve.

Table 5. The statistical comparison of mean values

Compared measurements	Average measurement (mm)	p-value
LCMN diameter	3.9±2.0	0.004**
ICBN origin diameter	2.0±0.7	
MCMN diameter	3.5±0.9	0.0001***
ICBN origin diameter	2.0±0.7	
LCMN diameter	3.9±2.0	0.168
ICBN coaptation point diameter	3.1±0.9	
MCMN diameter	3.5±0.9	0.232
ICBN coaptation point diameter	3.1±0.9	
LCMN diameter	3.9±2.0	0.302
MCMN diameter	3.5±0.9	
ICBN origin diameter	2.0±0.7	0.0001***
ICBN coaptation point diameter	3.1±0.9	
LCMN length	24.1±13.6	0.025*
MCMN length	33.5±17.4	
ICBN origin-branching distance	36.9±18.2	0.001***
ICBN-LCMN distance at 45° abduction	54.6±6.3	
ICBN origin-branching distance	36.9±18.2	0.0001***
ICBN-LCMN distance at 90° abduction	63.4±6.5	
ICBN origin-skin distance	79.2±15.5	0.0001***
ICBN-LCMN distance at 45° abduction	54.6±6.3	
ICBN origin-skin distance	79.2±15.5	0.001***
ICBN-LCMN distance at 90° abduction	63.4±6.5	

*P<0.05, **p<0.01, ***p<0.001. LCMN: Lateral contribution of the median nerve; MCMN: Medial contribution of the median nerve; ICBN: Intercostobrachial nerve.

at the nerve origin. Various studies reported a rate of single trunk ICBN ranging between 74% and 81.3%[15–18] and one study reported a rate of 93.3%,[2] which are similar to the present study.

The mean diameter of ICBN at its origin was 2±0.7 mm in that present study similar to the result of Zhu et al.[16] who reported as 1.9±0.4 mm and to the result of Foroni et al.[2] who reported as 2.1±0.7 mm. The mean diameter of ICBN at the point of its coaptation was 3.1±0.9 mm in that present study which is similar to the result of Foroni et al.[2] who reported as 2.7±0.9 mm. The mean distance between the origin and the branching point of ICBN was 36.9±18.2 mm in that present study, whereas Zhu et al.[16] reported 28.6±13.0 mm, Foroni et al.[2] reported 23.8±17.9 mm and Hwang et al.[19] reported 39.4±19.2 mm, which are similar. Foroni et al.[2] reported the mean diameter of LCMN as 3.7±1.1 mm. In the present study, the diameter of LCMN was 3.9±2.0 mm and of MCMN was 3.5±0.9 mm which are both similar to each other and that of Foroni's report.[2] The mean diameter of ICBN at the point of its coaptation was 3.1±0.9 mm in that present study and comparing those descriptive statistics, the diameters of ICBN, LCMN and MCMN were similar to each other which makes the ICBN a suitable candidate for both LCMN and MCMN. However, according to the Pearson correlation analysis, the diameters of the LCMN and MCMN are not significantly correlated with the diameter of ICBN and according to the paired t-test results, the diameter of MCMN, LCMN, ICBN coaptation point compared to the diameter of ICBN origin showed significant difference but there existed to be no significant difference between the LCMN, MCMN and ICBN coaptation point. This descriptive and inferential statistics results stand for a strong evidence for the similarity between LCMN, MCMN, and ICBN making ICBN a feasible candidate for LCMN and MCMN.

All the ICBNs dissected showed enough extension to reach the LCMN directly with an average distance of 54.6±6.3 mm and of 63.4±6.5 mm between ICBN and LCMN in 45 and 90° shoulder abduction, respectively. Similar results were depicted by Foroni et al.[2] as it was 54±10 mm from ICBN's origin to the LCMN's coaptation point. The average distance between the origin and the skin of ICBN was 79.2±15.5 mm and the average length of LCMN was 24.1±13.6 mm, so the ICBN could extend to both LCMN and MCMN. Similar re-

sults were reported by Foroni et al.[2] as all ICBNs had adequate extensions to reach the LCMN. That all the ICBN's exhibited enough length to reach the LCMN stands for strong evidence to use the ICBN for neurotization of the brachial plexus. Moreover, according to the paired t-test result, the distance between the ICBN origin and both coaptation point and the skin differed significantly from the distance between ICBN and LCMN at both 45° and 90° shoulder abduction because of being longer. The difference here is the advantage of ICBN so that it can reach easily to the brachial plexus. In other studies, only the descriptive statistics results were mentioned[2,15,16,18] and no statistical analysis was conducted.

Allieu et al.[20] reported that the utilization of spinal accessory nerve and cervical plexus components in a case series of 21 brachial plexus injuries were not successful and claimed that the surgery may lead to trapezius muscle palsy and important functional loss. However, such disadvantages have not been observed in the neurotization with the intercostal nerve especially ICBN.[2] In some other studies; the transfer of supraclavicular nerve, phrenic nerve, other intercostal nerves, and long thoracic nerve to median nerve had been reported but the results were either inconsistent or small number of patients had been involved.[4,13,21–24] Moreover, limited sensory recovery with those nerves had also been reported in several studies.[4,11–13,25] Evaluating the cortical topography plays also a key role in such reconstruction procedures and the cortical area similarity of ICBN to the hand area could make it a more successful donor.[2]

ICBN usually originates as lateral cutaneous branch of the second intercostal nerve.[3,8] However, it can exhibit anatomic variations in its course. Nayak and Banerjee reported that although all ICBNs originated from T2, 20.7% of 130 axillae had contribution from T3 and 3.8% from T1.[3] Zhu et al.[16] reported that the origin of ICBN comes from the second intercostal nerve as a single trunk in 120 cases, as double trunks in 23 cases and as multiple trunks in nine cases among 156 patients who underwent breast cancer surgery, while it was absent in 4 patients (2.56%). Andersen et al.[14] and Kubala et al.[15] reported the absence rate of ICBN up to 6%. However, Foroni et al.[2] reported that the ICBN was present in all of their dissections. ICBN was not observed in the left shoulder of cadaver number 2 in our study. In that shoulder, the dissection revealed that the lateral cutaneous branch of the third intercostal nerve divided into four branches at the nerve origin. The thick upper part of those four branches might be providing the functions of ICBN. This situation also should be taken into account by surgeons during surgical planning since the surgeons may encounter the absence of the ICBN after complicated dissection.

In the cadaver number 6, the diameter of LCMN on the right side was 3.4 mm whereas it was 10.0 mm on the left. It is evident that there appeared to exist a strong difference and outlier compared to other cadavers. The ratio between the extremities of cadaver number 6 was approximately 3:1 which did not exceed 2:1 in other cadavers. Besides, the length of LCMN on the left side of cadaver number 6 was shorter than the others. The measurements were repeated to confirm this variation and no mass lesion or neurovascular malformation was evident. The possibility of significant variations in diameter and length of the ICBN should also to be taken into consideration before operation. Similar significant variations were also reported in dissections of Foroni et al.[2]

This study also has several limitations. The measurements were performed on cadavers which can differ from living tissues. Fixing procedures, the death of tissues, and the water loss of cells may lead the results to deviate from reality. Since the shoulders of the cadavers could be positioned up to the 90° of abduction, the results were obtained in those positions. However, they may change and differ in more than 90° abduction of the arm. As this is a purely anatomical study, it needs to be supported by clinical studies. The sample size (eight cadavers and 16 axillae) was also another limitation.

Conclusion

Even though there are anatomical variations of ICBN, it could still be a feasible candidate for the neurotization to LCMN and MCMN in the restoration of the sensory damage of the hand. All the dissected ICBNs showed adequate length to reach the LCMN directly. Moreover, the diameters of ICBN, LCMN, and MCMN were similar to each other making the ICBN a suitable candidate for neurotization. The ICBN neurotization seems to be promising because other donor nerves either have more complications or possess limited sensory recovery capacity. The proximity of the cortical topography of the ICBN to the hand area is another advantage.

Ethics Committee Approval: This study was approved by the Cerrahpaşa Faculty of Medicine Clinical Research Ethics Committee (Date: 07.08.2018, Decision No: 77303040-604.01.01-33597).

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DENEYSEL ÇALIŞMA - *ÖZ*

İnterkostobrakiyal sinirin anatomik varyasyonları: Travmatik median sinir yaralanmasından sonra potansiyel bir nörotizasyon adayı olabilir mi?

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AMAÇ: Bu çalışma, travmatik median sinir yaralanmasından sonra eldeki duyusal hasarın restorasyonunda ICBN'nin olası kullanımını araştırmayı amaçlamıştır. ICBN nörotizasyonunun median sinire uygulanabilirliğini değerlendirmek için interkostobrakiyal (ICBN) sinir ve median sinirin anatomik özellikleri ve varyasyonları incelenmiştir.

GEREÇ VE YÖNTEM: Sekiz kadavranın 16 üst ekstremitesinde aksiller bölge diseksiyonu yapıldı. ICBN varyasyonları kaydedildi. ICBN'nin brakiyal pleksusa nörotizasyon açısından uygunluğunun ölçümleri milimetrik cihazlarla yapıldı. ICBN'nin median sinirin lateral (LCMN) ve medial (MCMN) katkılarının distal ucuna olan mesafesi ve ICBN, LCMN ve MCMN çapları ölçüldü.

BULGULAR: On beş aksiller diseksiyonda ICBN mevcutken kadavralardan birinin sol tarafında mevcut değildi. ICBN'nin başlangıç noktasındaki ortalama çapı 2.0±0.7 mm ve koaptasyon noktasındaki ortalama ICBN çapı 3.1±0.9 mm idi. LCMN'nin ortalama çapı 3.9±2.0 mm, MCMN'nin ortalama çapı 3.5±0.9 mm idi. ICBN'nin hem 45 hem de 90 derece omuz abdüksiyonunda, LCMN ve MCMN'ye uzanabilecek şekilde yeterli uzunluğa sahip olduğu bulundu. LCMN ve MCMN çapları, hem orijin hem de koaptasyon noktasında ICBN'nin çapı ile anlamlı derecede ilişkili değildi (LCMN: p=0.55–0.63 ve MCMN: p=0.89–0.85). LCMN çapı ile koaptasyon noktasındaki ICBN çapı arasında (p=0.168) ve ayrıca MCMN çapı ile koaptasyon noktasında ICBN çapı arasında (p=0.232) anlamlı bir fark saptanmadı.

TARTIŞMA: Disseke edilen tüm ICBN'ler, median sinirin lateral ve medial katkısına doğrudan ulaşmak için yeterli uzunluk gösterdi. Tanımlayıcı ve çıkarımsal istatistiklere göre ICBN çapı LCMN ve MCMN'ye yakın bulundu. Bu nedenlerle ICBN, travmatik yaralanmalar sonrası median sinir nörotizasyonu için uygun bir aday olabilir.

Anahtar sözcükler: Anatomi; interkostabrakial sinir; kadavra; median sinir; nörotizasyon; sinir transferi.

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