



CHEMOPORT INSERTION VIA INTERNAL JUGULAR OR SUBCLAVIAN VEIN –WHICH ONE IS BETTER? A COMPARATIVE STUDY

Surgery

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ABSTRACT

Chemoport insertion has improved quality of life for patients on chemotherapy. Chemoport insertion via IJV or SCV route may be done by surgeon or by interventional radiologists. This retrospective comparative study is conducted to compare outcome and complication of chemoport inserted via either routes. Result of this study shows both are similar in outcome and complication.

KEYWORDS

Chemoport, Internal jugular vein, Subclavian vein

INTRODUCTION

Chemoport insertion is preferred over intravenous (IV) access for patients who require long term chemotherapy to prevent untoward effects of multiple venepuncture, extravasation of toxic chemotherapeutic drugs and to improve quality of life (QOL)¹. Chemoport insertion dates back to 1982 when Niederhuber and colleagues implanted chemoport by surgical method². Commonest route of Chemoport insertion is either Internal jugular vein (IJV) or subclavian vein (SCV)³.

Aim of this study is to determine whether outcome and complication are different for chemoport insertion via IJV and SCV route.

MATERIAL AND METHODS

This retrospective comparative study is conducted in CTVS department in RGKar Medical College and Hospital. Patients who underwent chemoport insertion by a single surgeon (the author himself) from January 2017 to July 2019 were included in the study. Total 102 patients were operated for chemoport insertion. OT register, OPD register, patient documents were retrieved and data collected. Patients were divided in 4 groups – 1)Right IJV, 2)Right SCV, 3)Left IJV and 4)Left SCV. In 2 patients initial Left IJV insertion was converted to Left SCV insertion due to inadvertent carotid puncture-they were included in Left SCV group. Patients who died within 6 months (7 patients - expired due to other causes) after chemoport insertion were not included in the study.

Patients were routinely advised for chlorhexidine mouthwash⁴ and nasal mupirocin ointment (2%)⁵ 3-5 days prior to surgery to reduce chances of surgical site infection. Chemoport insertion was done under local anaesthesia. Though ultrasound guided venepuncture of central vein increases accuracy and reduces complication^{6,7}, landmark guided venepuncture was performed in all cases as our department didn't have a portable ultrasound machine. Ipsilateral Prepectoral pocket position was same for IJV or SCV group. Chemoport was fixed with non absorbable monofilament suture (polypropylene) to prevent flip over². SCV was approached via infraclavicular approach through mid or lateral third of the clavicle² to prevent "pinch-off syndrome"⁸. Catheter tip position was measured by an imaginary line mimicking course of catheter upto upper margin of right 3rd costosternal junction⁹. After completion of procedure, pressure dressing was applied to prevent hematoma formation. Post operative chest XRay was obtained to confirm the position of chemoport and catheter tip. Tab cefuroxime (500mg) or Tab ciprofloxacin (500mg, who were allergic to cefuroxime or penicillin) *BD given 1 day prior to surgery upto 4 days postoperatively (total 5 days, 10 tablets)¹⁰ to reduce chances of catheter related infection. Chemoport was flushed with 5ml of heparinised saline (100 IU/ml) using a Hüber needle @ 4 weeks interval (when not in use) or after each chemotherapy session¹¹.

Data was analysed using Microsoft excel 2013. Mean $\pm$ standard deviation is used to report Continuous variables and they are compared using the independent samples t-test (2 tailed). Categorical variables are measured as frequency and percentage of the total group and compared using Pearson's χ^2 test or Fischer exact test where applicable.

ANOVA test was used for independent measures. P-values ≤ 0.05 are considered significant.

RESULTS

Total 95 patients were included in the study. Table 1 shows their age & sex distribution, minimum age who underwent chemoport insertion was 28 years and maximum age was 76 years.

Table 1

N=95	Rt IJV (n=29)	Rt Subclavian (n=23)	Lt IJV (n=24)	Lt Subclavian (n=19)	
Age (years)	50.31 $\pm$ 13.63 (30-72)	51.70 $\pm$ 14.15 (29-75)	51.08 $\pm$ 14.16 (28-76)	51.21 $\pm$ 13.26 (32-69)	
sex					
male	10 (10.52%)	7 (7.37%)	9 (9.47%)	11 (11.58%)	37 (38.95%)
female	19 (20%)	16 (16.84%)	15 (15.78%)	8 (8.42%)	58 (61.05%)
total	29 (30.53%)	23 (24.21%)	24 (25.26%)	19 (20%)	

Table 2 shows that carcinoma breast patients were more common to receive a chemoport than other malignancies & preoperative bleeding parameters of the study population prior to chemoport insertion. If prior to surgery bleeding parameters were abnormal, it was corrected, test repeated and when normalized then chemoport was inserted.

Table 2

N=95	Rt IJV (n=29)	Rt Subclavia n(n=23)	Lt IJV(n=24)	Lt Subclavia n(n=19)	Total/P value
Carcinoma breast	17 (17.89%)	13 (13.68%)	11 (11.58%)	7(7.37%)	48 (50.53%)
Colon Ca	7 (7.37%)	6 (6.32%)	8 (8.42%)	5(5.26%)	26 (27.37%)
Periapillary Ca	4 (4.21%)	2 (2.11%)	3 (3.16%)	3 (3.16%)	12 (12.63%)
Lung ca	1(1.05%)	2(2.11%)	2(2.11%)	4(4.21%)	9(9.47%)
Platelet count	155107 $\pm$ 37488	157005 $\pm$ 33357	156667 $\pm$ 36065	148158 $\pm$ 37786	.852646.
INr	1.19 $\pm$ 0.21	1.18 $\pm$ 0.21	1.22 $\pm$ 0.19	1.23 $\pm$ 0.16	.794047

Table 3 does not show any significant difference in operating time, complication or outcome among all groups. Chemoport was explanted in all total 4 patients due to infection(3) and skin necrosis(1). Hematoma occurred in 5 patients which were drained, hemostasis secured, pressure dressing applied and antibiotic given- all of them did well. All chemoport were patent after 6 months of follow up, i.e. No statistically significant difference is found between patency of chemoport inserted either via IJV route or via SCV route.

Table 3

	Right IJV (n=29)	Right Subclavian (n=23)	Left IJV (n=24)	Left Subclavian (n=19)	P value
Operating time (minutes)	56.7931 $\pm$ 3.7357	56.7826 $\pm$ 3.5156	56.5833 $\pm$ 3.5743	57.1579 $\pm$ 3.6707	.965365

Thrombosis of central vein(0)	0	0	0	0	1
Hematoma over pocket(5)	1	2	1	1	.6519
Flip over(0)	0	0	0	0	1
Infection (3)	1	0	0	2	.5819
Skin necrosis(1)	0	1	0	0	.4421
Pinch off syndrome (0)	0	0	0	0	1
Catheter tip malposition	0	0	0	0	1
Patency @ 6 months	28	22	24	17	.71532

DISCUSSION

Chemoport insertion prior to initiation of chemotherapy increases success rate². Chemoport can be inserted via IJV, SCV or cephalic vein cutdown¹². Studies have shown that both IJV and SCV route are comparable to each other in terms of success and complication rate.²

The commonest complication after chemoport insertion are thrombosis, infection, skin necrosis, catheter tip malpositioning and catheter compression^{1,2,6}. Some studies showed thrombosis occurred more common with SCV whereas other studies showed thrombosis occurred in IJV group more^{3,12}. Infection rates are similar in both IJV and SCV route^{2,3}. Catheter tip position remains more constant when placed via IJV route³.

The main advantages of IJV over SCV access are 1) reduced periprocedural complications, 2) better ultrasound control, 3) no pinch-off, 4) lower migration, 5) lower venous thrombosis, 6) low pain perception^{2,3}. Advantage of SCV over IJV are 1) short procedure time due to non requirement of tunneling and no second incision at the neck¹³.

Flip over of chemoport is an extremely rare condition¹⁴. Chemotherapy was started as early as after 72 hours after chemoport insertion¹⁵ in this study.

In this study, no significant difference was found among all groups regarding outcome and complication.

CONCLUSION

Present study does not show any significant difference between IJV and SCV insertion of chemoport regarding outcome and complication.

Limitation Of The Study

This study is retrospective in nature and sample size is small as well as randomization could not be done. Prospective RCTs will be more beneficial to come to a definitive conclusion.

Acknowledgement

Nil

Conflicts Of Interest

None declared

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