

Robotic Assisted Nasopharyngectomy for Recurrent Nasopharyngeal Carcinoma

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Background

- With modern chemoradiation techniques, around 14% of nasopharyngeal carcinoma (NPC) patients developed local recurrence.
- Salvage treatment of local recurrence included second radiation, open nasopharyngectomy and minimally invasive nasopharyngectomy.
- An large randomized controlled trial showed endoscopic nasopharyngectomy offers better overall survival then re-irradiation in patients with resectable recurrent NPC¹.
- Endoscopic nasopharyngectomy is a technically demanding operation. The da Vinci surgical robot provides a stable endoscopic platform that has improved dexterity to perform minimally invasive nasopharyngectomy

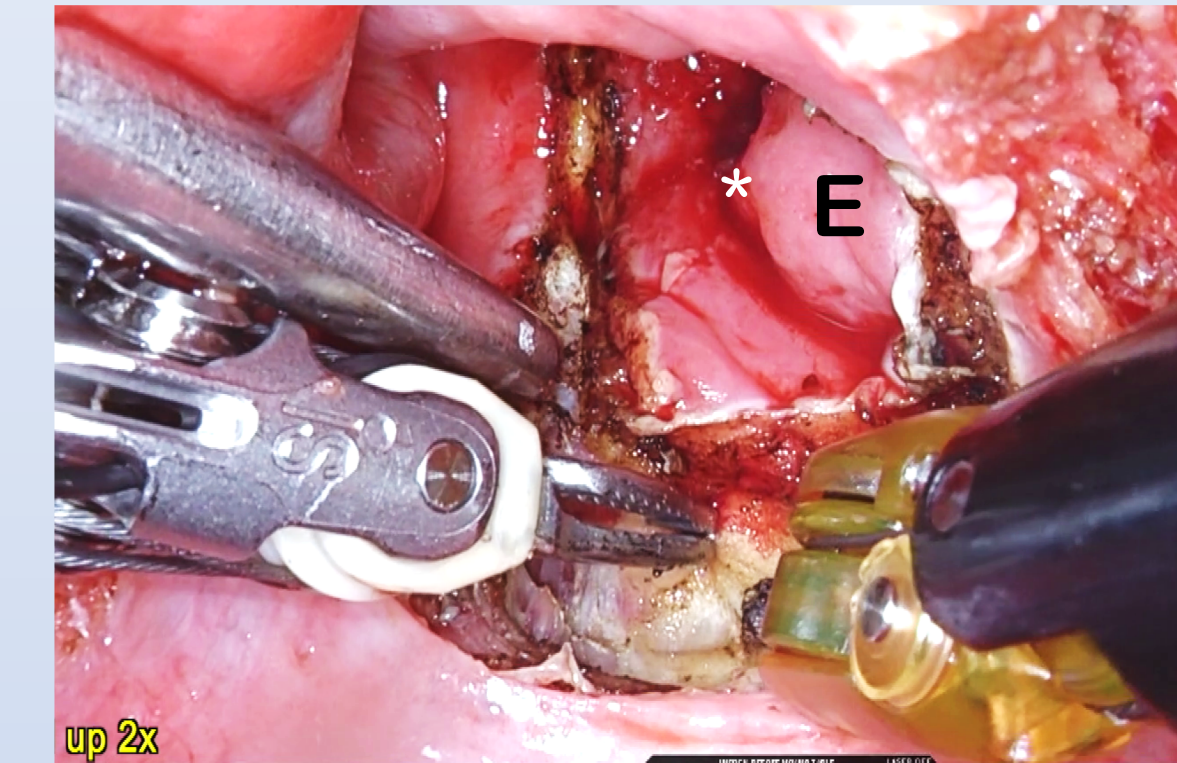
Materials and Method

We report our prospective series of patients who underwent robotic assisted nasopharyngectomy for local recurrent nasopharyngeal carcinoma from January 2010 to March 2019. Early results had previously been reported².

- Total of 33 procedures in 31 patients.
- 20 male, 11 female; median age 55 (29-85)
- Median interval to recurrence 32m (11-280)
- 25 rT1 and 11 rT3 stage (T3 due to sphenoid floor invasion)
- 31 procedures with da Vinci S robot, 2 with da Vinci Xi robot

Result

- 27 patient had robotic assisted nasopharyngectomy
- 6 patients had combined endoscopic + robotic nasopharyngectomy
- 2 patients had concomitant neck dissection
- Median operating time – 227 min (97 - 574)
- Median blood loss – 200ml (20-1800), 2 patients required intraop transfusion
- Median follow up – 38 months (2.9 – 131)



Above: Screen capture of procedure of transoral robotic nasopharyngectomy. The Maryland cautery spatula is dissecting the nasopharynx mucosa from the prevertebral muscle. E denotes the left Eustachian tube cushion, white asterisk denotes the tumor.

Right: The surgical field after robotic nasopharyngectomy viewed from the endoscope of the robot. E denotes the right Eustachian tube cushion. The exposed bone was the clivus bone and the muscle inferior was the divided prevertebral muscle.



Survival Results

- Median overall survival – 87 months
- 5 year overall survival – 55.7%
- 5 year disease specific survival – 68.9%
- 5 year local control – 85.1%
- 8 patient had positive margins, 2 rendered negative after re-resection
- Positive margin is a predictor for poor OS (p=0.02, log-rank test) and local control (p<0.001, log-rank test)

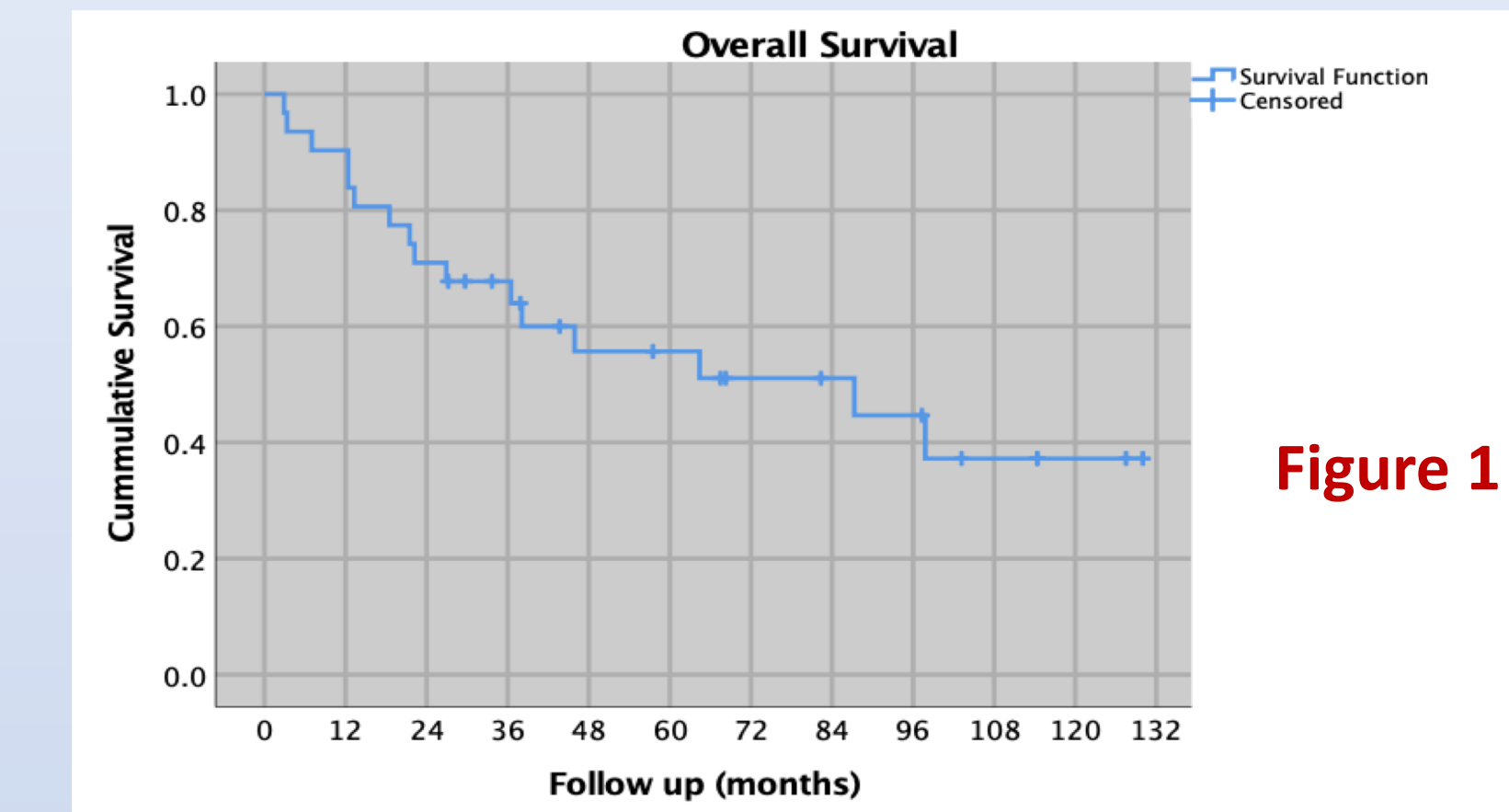


Figure 1

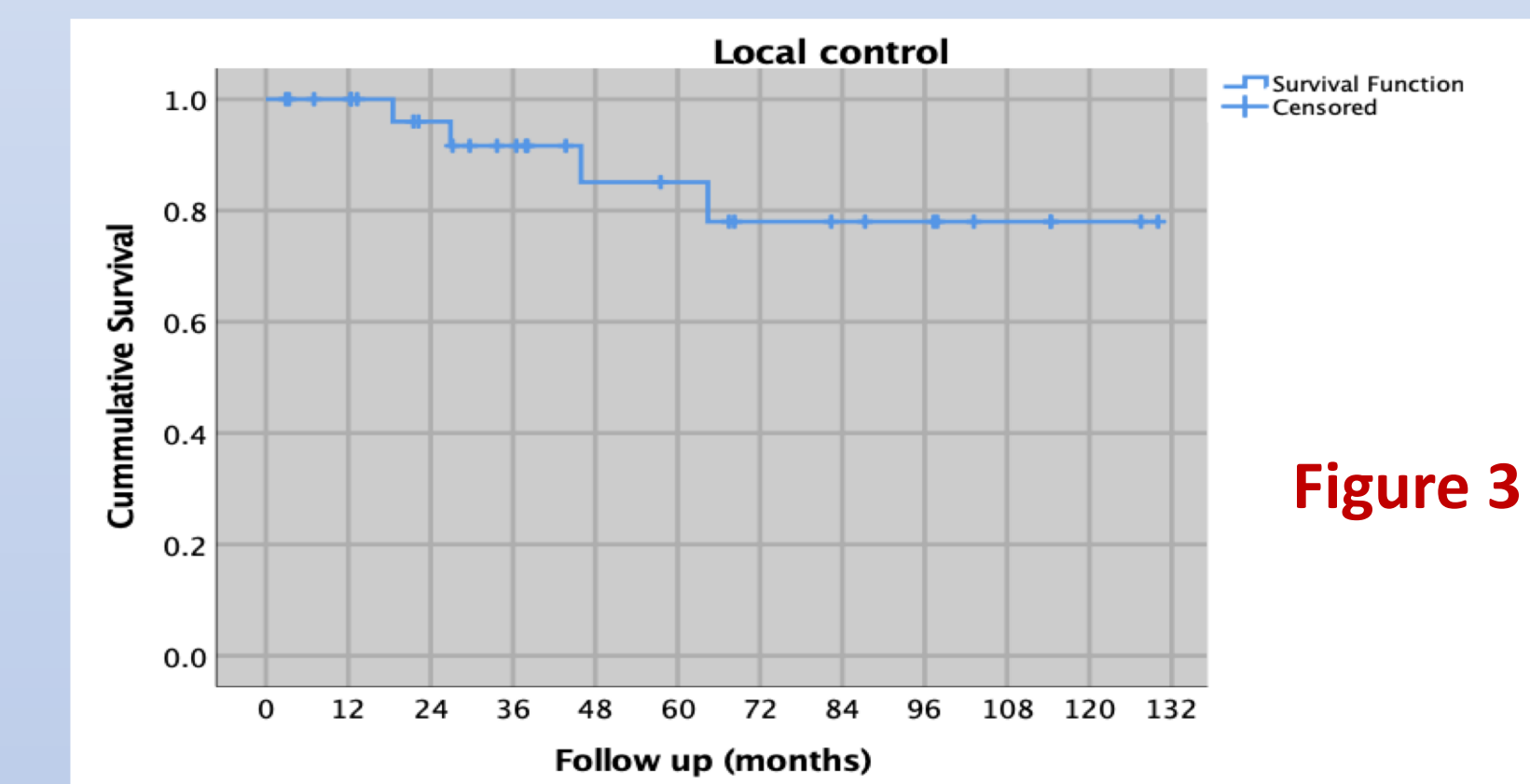


Figure 3

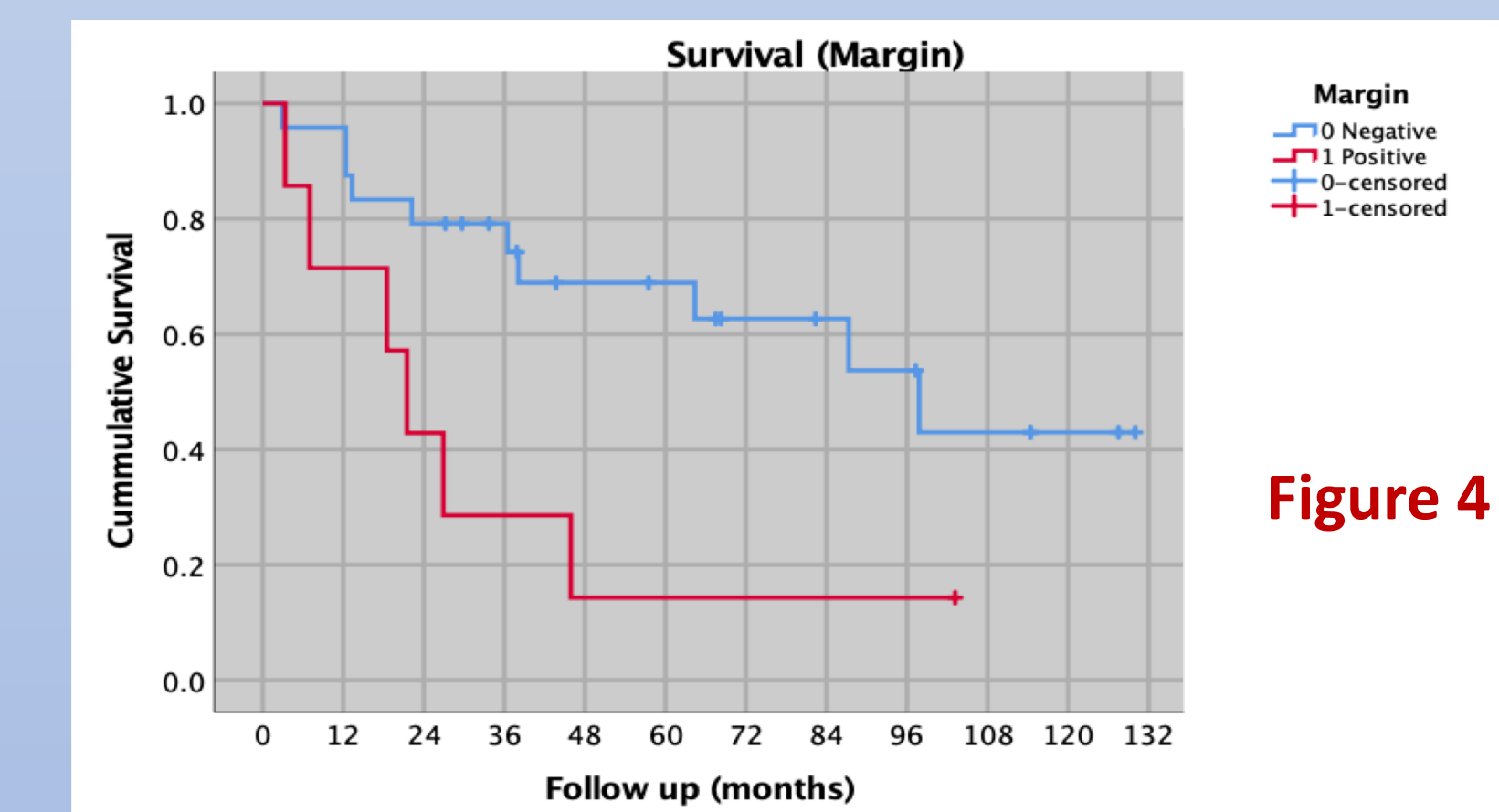


Figure 4

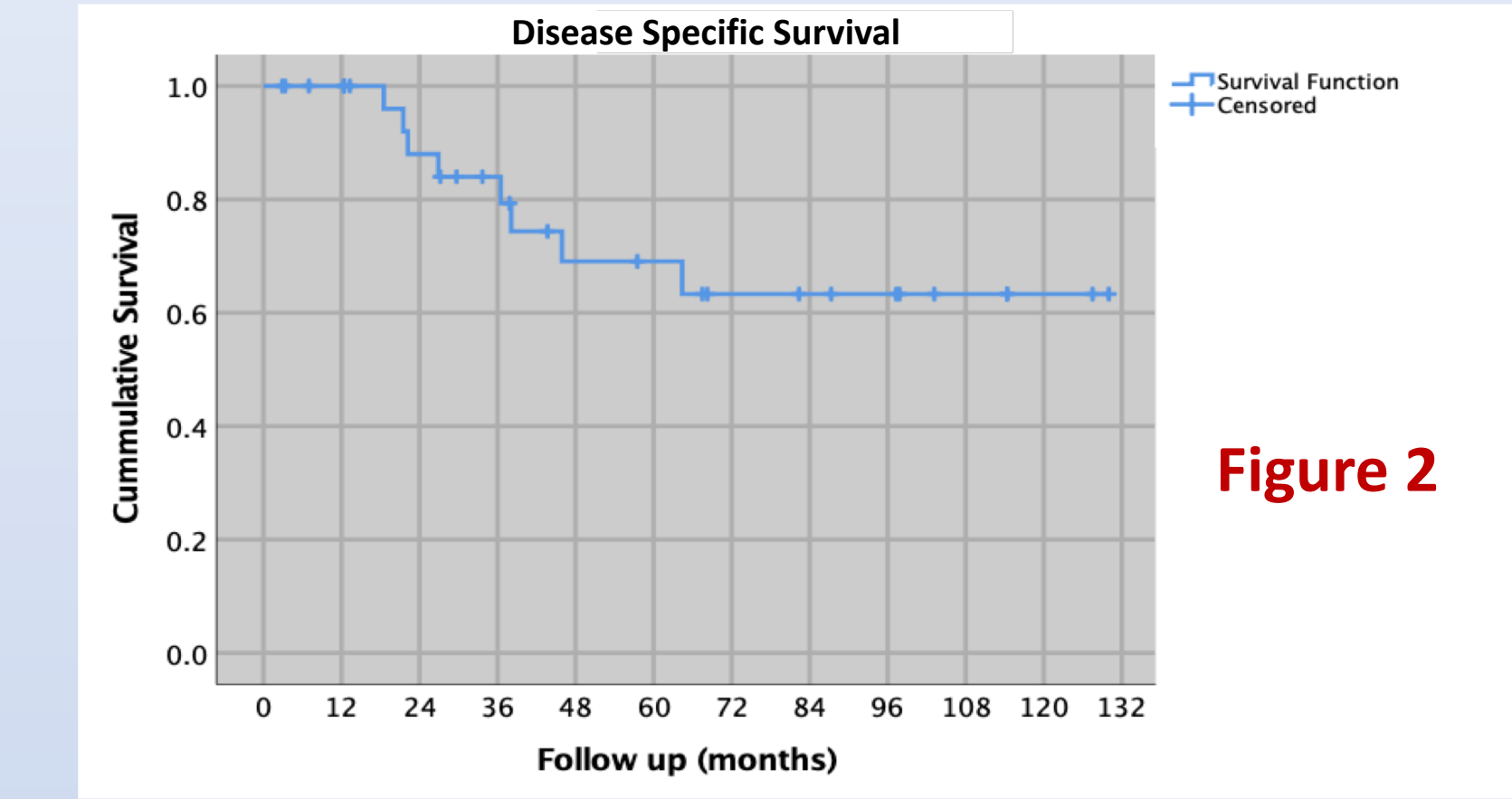


Figure 2

Figure 1 – KM plot of over all survival

Figure 2 – KM plot of disease specific survival

Figure 3 – KM plot of local control

Figure 4 – Overall survival vs margin status

Figure 5 – Local control vs margin status

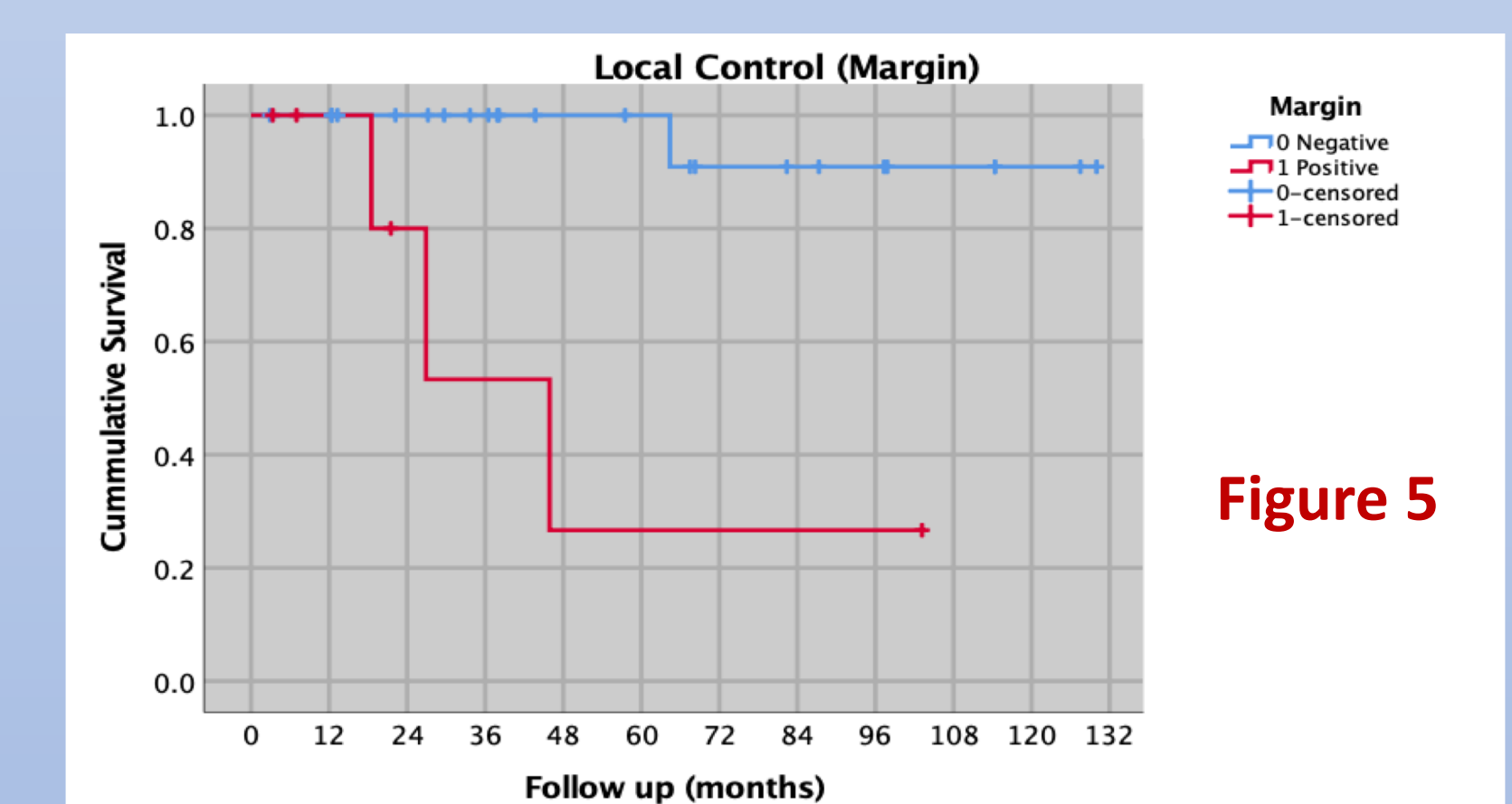


Figure 5

Conclusions

- Robotic assisted nasopharyngectomy has similar local control and survival outcome to endoscopic nasopharyngectomy
- Positive margin is a predictor of poor local control and poor survival
- Advantages of robotic approach include stable endoscopic platform and improved dexterity
- Disadvantages include cost, lack of tactile sensation and difficulty in control bleeding in case of major vessel injury.

References

- Liu Y-P, Wen Y-H, Tang J, et al. Endoscopic surgery compared with intensity-modulated radiotherapy in resectable locally recurrent nasopharyngeal carcinoma: a multicentre, open-label, randomised, controlled, phase 3 trial. *Lancet Oncol*. 2021;22(3):381-390.
- Tsang RK, To VS, Ho AC, Ho W-K, Chan JY, Wei WI. Early results of robotic assisted nasopharyngectomy for recurrent nasopharyngeal carcinoma. *Head & neck*. 2015;37(6):788-793