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Below Knee Amputations in Central Switzerland Between 2009 and 2019

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INTRODUCTION

Primary below knee amputations (BKA) are frequently the last option in surgical treatment for many medical conditions and are often performed in order to save a patient's life. Studies showed that the mortality after BKA is generally very high.^{1,2,3,4} This study aims to analyze all BKAs performed in a defined episode of time in three hospitals in central Switzerland.

We therefor asked, (1) what are the primary diagnoses for BKA, (2) what is the cumulative survival rate of BKA amputees, and (3) what are risk factors for death after BKA?

METHODS

We retrospectively reviewed all patients who underwent BKA at one of three hospitals of the same public hospital group, consisting of two level 2 rural hospitals and one level 3 main hospital, between January 2009 and December 2019. This resulted in 95 primary BKA. Patient parameters were extracted from the clinical information system. Survival rates were calculated according to Kaplan-Meier and univariate Cox regression analysis was performed to identify risk factors for death.

Faktor	Hazard ratio (univariate analysis)	p-value
Age at surgery (per y)	1.039 (1.002-1.076)	0.037
ASA score	4.896 (2.042-11.743)	<0.001
Smoking (per py)	1.036 (1.007-1.066)	0.016
Leukocyts (G/L)	1.069 (1.002-1.142)	0.044
INR	2.030 (1.171-3.521)	0.012
Systolic blood pressure (>140mmHg)	3.844 (1.231-12.004)	0.020
Secondary wound closure	4.440 (1.030-19.137)	0.046

Table 1 Hazard ratios for death one year after BKA with (95% confidence interval), py: pack years

RESULTS

The main reason for Burgess amputation was vascular disease in 53%, diabetes in 19%, infection (w/o diabetes) in 15%, trauma in 9%, and other causes in 4%.

The 30-day, 6-months, 1-year, and 5-years cumulative survival rate of patients undergoing BKA is 84.3% (95% confidence interval [CI] 76.8 – 91.9%), 82.0% (95% CI 74.3 - 89.8%), 75.2% (95% CI 66.0 - 84.3%), and 48.6% (95% CI 34.1 – 63.2%), respectively (Figure 1). Patients died at a mean age of 74.3 years (50.9 – 98.9y).

Several univariant risk factors for death after BKA were identified (Table 1).

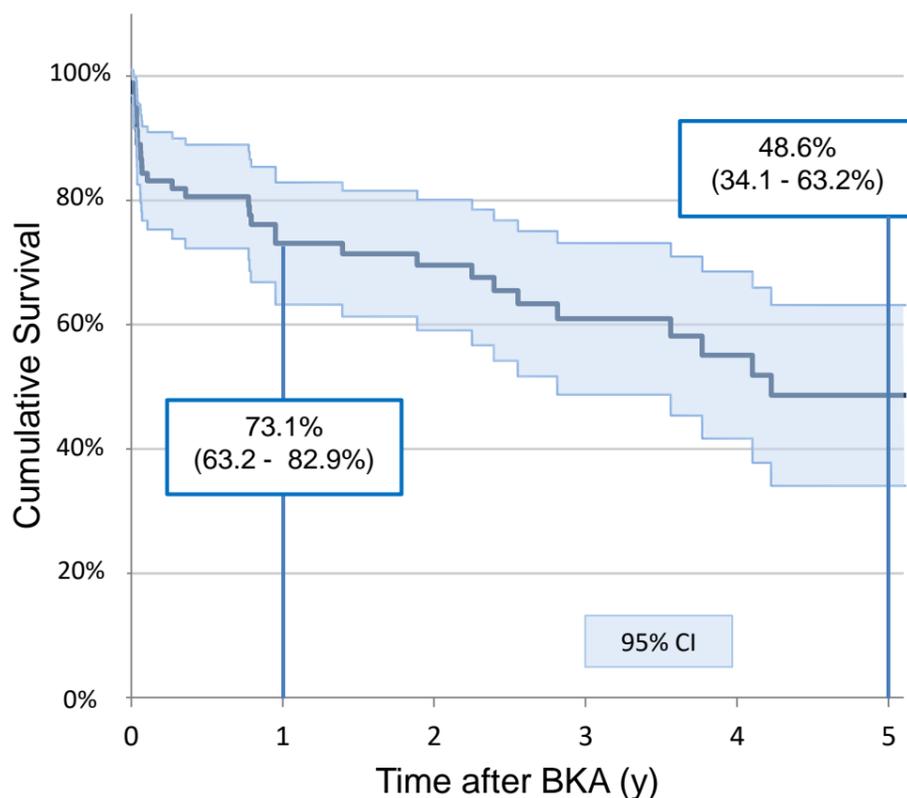


Figure 1 Kaplan-Meier curve for survival after BKA, Marked are the 1- and 5-year survival rate; 95% CI: 95 % Confidence Intervall

CONCLUSION

Mortality after BKA is high. Almost 15% of the study population had died 30 days postoperatively and the mortality after one year was 75.2%. These results are in agreement with mortality rates found in other studies.^{1,2,3}

Most identified risk factors underline frailty of patients undergoing BKA. But it could be shown that secondary wound closure seems to increase mortality after surgery. This could be interpreted as an argument to rather revise BKA amputees with higher level amputations instead of attempting secondary wound closure with multiple revisions surgeries and prolonged hospital stays. However, this stands in contrast to the current literature, which identifies higher level amputations to be associated with higher mortality.^{2,4}

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