Frequency and consequences of septostomy after laser therapy in twin-to-twin transfusion syndrome

MAŁGORZATA ŚWIĄTKOWSKA-FREUND, ZOFIA PANKRAC, KRZYSZTOF PREIS, ANETTA TRACZYK-ŁOŚ

Abstract
Septostomy is one of the unavoidable complications of twin-twin transfusion treatment by fetoscopic laser coagulation of communicating vessels. There are cases where it is intentional due to intertwin membrane localization, but in some cases it is unintentional and not predicted before surgery. Iatrogenic monochorionicity increases risk of cord entanglement and unfavorable pregnancy outcome. Authors analyzed group of 91 patients with monochorionic diamniotic twin pregnancy, who underwent fetoscopy due to TTTS. In 13 (14.3%) cases septostomy was diagnosed after surgery. Survival rates till delivery (at least one survivor, two survivors and survival rate of all the children), gestational age at delivery, time from surgery to delivery and survival till the end of first moth of life were analyzed. There were no significant differences except the incidence of survival till delivery – more children survived in patients with septostomy than in the group without septostomy (88.5% versus 69.2%, p = 0.04). This difference was not clinically important because survival rates calculated for one month after delivery were similar for both groups (76.9% and 60.3% respectively, p = 0.10). Septostomy at the time of laser therapy of TTTS did not worsen prognosis, and the women can be assured that it is not related to poor pregnancy outcome.

Key words: twin-twin transfusion syndrome, fetoscopy, laser, septostomy, complications

Introduction
Intentional or unintentional septostomy during fetoscopy in twin-to-twin transfusion syndrome (TTTS) is a complication implicating higher risk of unfavorable pregnancy outcome. Possibility of cord entanglement and intrauterine fetal asphyxia or demise in monoamniotic gestation were described by many authors and are difficult to avoid [1, 2]. Close surveillance and early delivery are known to improve results, but in some cases monoamnionicity is still life-threatening situation [2, 3]. Despite high risk of complications septostomy is still accepted treatment option in twin-to-twin transfusion syndrome in many centers [4-7], but most physicians accept it as a surgery complication sometimes unavoidable, but always worsening prognosis [8].

Material
Authors analyzed data of 91 patients with twin-to-twin transfusion syndrome (TTTS) treated with selective laser coagulation of communicating vessels in Department of Obstetrics of Medical University of Gdansk in Apr 2005 - Jan 2010. In three patients (3.3%) surgery was performed twice, once due to reversed TTTS, twice due to recurrence of TTTS.

TTTS was diagnosed as monochorionic diamniotic twins with oligohydramnios in one amniotic sac – MVP (maximal vertical pocket) of 2 cm or less – and polyhydramnios in the other one – MVP of 8 cm or more. Staging according to Quintero was used [9].

Surgery was performed by two surgeons. After surgery ultrasound follow-up was performed on 1st, 3rd and 7th day and then according to the situation every 7-14 days. Pregnancy follow-up and outcome was known for all the patients.

Methods
Data about surgery were collected from hospital records, about ultrasound results and delivery – from referring physicians and from the patients. Statistical analysis was performed in Microsoft Office Excel 2003 Worksheet. All variables and measurements were tested for normality. Categorical variables were assessed by Chi$^2$ test for independence. To compare means T-Student test was used. A $p$ value of < 0.05 was considered statistically significant.

Results
Between April 2005 and January 2010 in the Department of Obstetrics of Medical University of Gdansk 94 fetoscopic selective laser photocoagulation of communicating vessels (SLPCV) in 91 patients were performed.
Septostomy was diagnosed in 13 (14.3%) cases (in one patient after second surgery).

Patients were referred most often in 3rd stage according to Quintero staging (48.3%). Median gestational age at the surgery was 21 weeks and ranged between 17 and 26. There was no difference between group with and without septostomy.

Median gestational age at delivery was 30 weeks, and after excluding pregnancy losses before 24 weeks – 32 weeks, and was the same for patients with and without septostomy. Average time from surgery to delivery was 8 weeks.

Pregnancy loss before 24 weeks was noted in 14 cases (15.4%) and was the same for patients with and without septostomy (7.7% and 16.7% respectively, $p = 0.41$). Fetal demise was diagnosed in 24 patient of the ones, who delivered after 24 weeks of gestation (36.4%). In group of patients with septostomy incidence of fetal demise was similar to the group without septostomy – 33.3% and 36.8% respectively.

Two alive babies were delivered by 54 patients out of all 91 (59.3%), one alive baby – 23 women (25.3%) what gives incidence of having at least one live born child 84.6% and survival rate 71.2%. Survival rates for patients with and without septostomy were similar: at least one survivor in 100% and 82% respectively ($p = 0.10$), two survivors in 76.9% and 56.4% respectively ($p = 0.16$), but overall survival rate per all children was higher in the group with septostomy – 88.5% and 69.2% respectively ($p = 0.04$). When analyzing survival after first month of life, death of 17 of 131 live born children was noted. That gave survival rate of all the children 62.6%; 60.3% (94 out of 156 children) for pregnancies without and 76.9% (20 out of 26 children) for pregnancies with septostomy ($p = 0.10$). Data are shown in table 1.

### Table 1. Survival rates after laser treatment of TTTS in patients with and without septostomy

<table>
<thead>
<tr>
<th></th>
<th>Survivors at delivery</th>
<th>Survivors one month after delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>at least one</td>
<td>two per all children</td>
</tr>
<tr>
<td>No septostomy</td>
<td>64 (82.0%)</td>
<td>44 (56.4%)</td>
</tr>
<tr>
<td>Septostomy</td>
<td>13 (100.0%)</td>
<td>10 (76.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>77 (84.6%)</td>
<td>54 (59.3%)</td>
</tr>
<tr>
<td>Chi² test; $p$</td>
<td>0.10</td>
<td>0.16</td>
</tr>
</tbody>
</table>

### Discussion

There are many reports of life-threatening complications of monoamniotic pregnancies including cord entanglement with double intrauterine fetal demise [1, 2]. Management of these pregnancies requires close follow-up and early delivery [2, 3]. Iatrogenic monoamnionicity is unavoidable in some patients undergoing invasive procedures. It is more frequent after laser therapy for TTTS, but happens also after amniocentesis or amnioreduction [8].

Authors proved, that in the group after laser therapy for twin-twin transfusion syndrome iatrogenic monoamnionicity didn’t worsen prognosis for the fetuses. It was assumed, that pregnancies with septostomy are followed very close, more frequent obstetrical visits are advised, and every complication of monoamnionicity can be diagnosed early enough to prevent fetal demise. This theory was not confirmed by data regarding gestational age at the delivery. Patients after septostomy were not delivered earlier, what should be seen if complications of monoamnonicity was additional reason for labor induction or cesarean section before term.

No reports of pregnancy outcome after TTTS treatment complicated by septostomy were found in the literature. Analyses of monoamniotic and diamniotic pregnancies can be hardly compared to the situation of TTTS patients, as further management of these patients is different than that of healthy twin gestation [8, 10]. Assumption of worse prognosis in cases with septostomy was not confirmed in analyzed group of patients, there was even trend towards better pregnancy outcome but with available number of patients it was not significant.

### Conclusions

Septostomy during laser therapy for twin-twin transfusion syndrome does not worsen prognosis for the pa-
tient. It can be considered as a not harmful complication of surgery.

References


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