Scientific Research Publishing

Surgical Science, 2024, 15, 409-419
https://www.scirp.org/journal/ss
ISSN Online: 2157-9415
ISSN Print: 2157-9407

Postoperative Complications in the General Surgery Department of the Cs Ref of Commune I of the District of Bamako Mali

Tounkara Cheickna[1*], Samake Hamidou[2], Dembele Lamine[1], Diarra Issaka[1], Togola Modibo[1], Sanogo Modibo[1], Dembele Bakary Tientigui[3], Traore Alhassane[3], Togo Adégné Pierre[3], Kante Lassana[3]

[1]Department of General Surgery, Reference Health Center of Commune I of Bamako, Bamako, Mali
[2]Directorate of Social and Health Services of the Armies, Bamako, Mali
[3]Department of General Surgery, CHU Gabriel Touré, Bamako, Mali
Email: *tounk_ch@yahoo.fr

How to cite this paper: Cheickna, T., Hamidou, S., Lamine, D., Issaka, D., Modibo, T., Modibo, S., Tientigui, D.B., Alhassane, T., Pierre, T.A. and Lassana, K. (2024) Postoperative Complications in the General Surgery Department of the Cs Ref of Commune I of the District of Bamako Mali. *Surgical Science*, **15**, 409-419.
https://doi.org/10.4236/ss.2024.156037

Received: May 3, 2024
Accepted: June 23, 2024
Published: June 26 2024

Abstract

Postoperative complications represent important indicators for the quality of surgical care. The objectives of this work were to study post-operative complications in the general surgery department of the Cs ref of commune I in Mali, to determine the frequency of post-operative complications, to identify the factors of occurrence, to describe the clinical aspects, diagnostic and therapeutic in order to assess the additional cost linked to post-operative complications. This study was prospective, carried out in the general surgery department on 300 cases of surgical interventions. It covered all patients aged at least 15 years, operated on and hospitalized or not, and who presented complications during the 30 days postoperatively. Patients under the age of 15 were not included (our general surgery department is not a pediatric surgery department). We collected 300 patients among whom 199 (66.33%) were men and 101 (33.66%) women, *i.e.* a sex ratio = 1.9. The average age was 38 years with extremes of 15 and 87 years. The main initial diagnoses were: acute appendicitis, peritonitis, occlusions, wall hernias, hemorrhoids, uterine prolapse, uterine myomas, ovarian cysts and acute cholecystitis. Emergencies represented 43% (N = 129) of interventions with 6.98% post-operative complications (POC). Postoperative complications were dominated by surgical site infections, 75% of cases (N = 20), wall hemorrhage 5% (N = 1), testicular necrosis 5% (N = 1) and testicular calcification 5% (N = 1), wire rejection 5% (N = 1) and death 5% (N = 1). The management of postoperative complications was surgical in 95% and medical in 100%. Their occurrence extended the hospital stay by 3.65 days and increased the average cost of care by 60541.85 CFA francs. The mortality index lowered by efficient management

of complications (IMAGE) calculated in relation to deaths was 95% of cases. Anemia, ASA score ≥ III, Alteimeir II and IV classes, duration of surgery and post-operative hospitalization were factors contributing to post-operative complications.

Keywords

Complications Post Opératoires, Chirurgie, Cs Ref CI, Bamako, Mali

1. Introduction

Post-operative complications refer to all incidents or accidents that may occur during or after any surgical procedure. They lead to the aggravation of the previous situation through their morbidity and even their mortality and are called early when they occur within thirty (30) days following the intervention [1]. Despite less and less invasive, increasingly efficient techniques and means for the rapid rehabilitation of surgical patients in order to reduce post-operative morbidity; Postoperative complications remain a significant problem in surgery [2].

In Cameroon: Overall frequency of early CPOs: 14.3% (38/265) in Yaoundé; infections, 50.1% (19/265); postpartum hemorrhage 34.2% (13/230), intestinal obstructions 5.3% (2,265) and deaths 5.3% (2/265) [3].

In America: 2 to 5% of patients operated on with an additional cost of $3.7 million, excess hospitalization days and $1.6 billion in additional hospitalization [4].

In Brazil: Surgical site infection rate, 3.3% for laparotomies while in Thailand the rate was 1.4% after cesarean section, appendectomy and hysterectomy according to Kasatpibal N. [5] [6].

In France: Mortality rate, 0.60% and morbidity rate of 5.3% after a prospective study of the surgical outcomes of 11756 patients [7].

In Germany: Markus reported a postoperative complication rate of 29.5% [8].

In Africa, south of the Sahara: Postoperative complications dominated by infections which represent 7% [2] [4].

In Mali: 22.4% with a mortality rate of 5.2% and morbidity of 17.2% with an average cost of care of 110690 CFA francs [9]; A postoperative complication rate of 15.4% with 6.94% infections and 2.4% postoperative mortality was found in 2006 in the surgery department of the Gabriel Touré University Hospitalization Center. The average cost of treatment was 130590 CFA francs [10].

Quality of care is increasingly becoming an obligation in surgery. Postoperative complications constitute a major indicator for assessing the quality of surgical care. The etiologies are multiple and varied. We are a second reference center with a limited technical platform and whose antibiotic therapy was systematic in all our patients because the zero risk of post-operative infectious complications did not exist.

The absence of scientific data on postoperative complications at the Cs ref CI

in Bamako and the evaluation of our quality of care, motivated us to carry out this work in order to evaluate the results of our surgical practice. Overall, our main objective is to develop an adequate prevention protocol to minimize or reduce the risk of post-operative infections in the department.

2. Research Methodology

This work was a prospective study carried out in the Reference Health Center of Commune I of the District of Bamako in Mali, covering 300 cases of surgical intervention. Our sample size was calculated by the formula: $N = 4\ P\ Q/\ L^2$ $Q = 1 - P$; I = the risk of error 0.695296 4 = a constant ~ $(1.9)^2$. We retained the complications according to Clavien and Dindon.

- Inclusion criteria: This study focused on all patients aged over 15 years, operated on in general surgery at the Cs Ref of commune I of Bamako.
- Non-inclusion criteria: We did not include in this study:

*Any non-operated patient hospitalized in the department,

*Any patient operated on but whose postoperative follow-up was carried out in another department or in another establishment,

*Any patient under the age of 15 who has undergone surgery and is hospitalized in the department,

*Any patient operated on in another health facility.

The variables studied were: (Preoperatively): sociodemographic data, medical-surgical history, clinical and biological information, diagnosis and preoperative treatment.

(Intraoperative): the type of surgery, the pre- and intraoperative diagnosis, the duration of the intervention, the antibiotic prophylaxis, the operating technique used, the Alteimeir score, the ASA score.

(Postoperatively): postoperative complications, clinic of postoperative complications, biological examinations of postoperative and/or radiological complications and their results, treatment of postoperative complications and the cost linked to the management of complications.

The pus samples were taken and examined in a private clinic 300 meters away and the additional examinations at the Cs ref of commune I.

We included complications that appeared during the 30 days following the operation. Depending on the complication found, the Clavien and Dindon classification of postoperative complications (CPO) was adopted.

The media used were the patients' medical files, the outpatient consultation and hospitalization registers, recording the patients' reports, the individual investigation sheet and the anesthesia protocol.

Data entry was carried out using Excel 2013 software and analysis using Epi info version 6.0. The comparison tests used were the Student and Chi^2 test with $P < 0.05$.

3. Results

We identified 300 patients: 199 (66.3%) males and 101 (33.7%) females including

20 cases of post-operative complications or 6.67%, including: 15 cases of infections of the surgical site accounting for 75% of complications.

The average age was 38 years with extremes of 15 years to 87 years, a standard deviation of 18 and a sex ratio of 2 in favor of the male sex. Housewives were represented in 24% of cases; single 70.33% of cases; 43% received emergency care and 65.67% of patients resided in commune I of Bamako (Table 1). Abdominal pain was associated with 70% of complications; 80% of complications classified as Grade II of the WHO Score (Table 2). A discharge of pus was observed in 60% of complications and 18.33% of patients had an inguinal hernia or 40.44% of wall pathologies. Acute appendicitis represented 22.33% of patients or 55.83% of digestive pathologies; (Table 3) 4.67% an ovarian cyst or 41.18% of gyneco-obstetric pathologies; varicocele and testicular ectopia each 1% or 30% each of urological pathologies and acute peritonitis in 30% of cases or 2% of our patients.

The rate of surgical site infections was 5%, or 75% of the complications observed, and 40% of ASA class II complications, or 2.67% of patients (Table 4, Table 5). Postoperative complications represented 7% of cases. *Escherichia coli* was found in 64.3% of the samples taken (Table 6, Table 7). Hyperleukocytosis was associated with cases of E. coli or 40% of cases.

Evacuation and secondary suture were performed in 85% of patients who presented complications (Table 8). The average additional cost linked to the management of complications was 60541.85 FCFA (Extremes of 5000 to 282752 FCFA) with a standard deviation of 62455.37 FCFA. This additional cost is higher than the minimum wage in Mali (Table 9).

Table 1. Socio-demographic data.

Socio-demographic data		Number	Percentage
Age	15 - 25 years old	74	24.67
	26 - 35 years old	81	27
	36 - 45 years old	62	20.66
	45 years and over	83	27.67
Sex	Male	198	66
	Feminine	102	34
Occupation	Peasant	50	16.67
	Trader	32	10.66
	Pupil/Student	51	17
	Household	72	24
	Others	95	31.67
Origin	Municipality I	197	65.67
	Other municipalities	49	16.33
	Regions	54	18
Total		300	100

Table 2. Distribution of complications according to clinic.

Clinic data		Complications	
		Effective	Percentage
General signs	WHO Grade I score	3	15
	Grade II	**16**	**80**
	Grade III	1	5
	Fever	12	60
	Pallor	4	20
	Oliguria, jaundice, apnea and polypnea	6	30
	Tachycardia	7	35
	Bradycardia	6	30
Functional signs	Abdominal pain	**14**	**70**
	Cough	1	5
	Burning when urinating	1	5
	Vomiting	1	5
	Diarrhea	2	10
Physical signs	Discharge of pus	**12**	**60**
	Impasto	1	5
	Rattle, rhonchi, wheezing	1	5
	Hemorrhage	1	5
Total		**20**	**100**

Table 3. Pathologies operated on in the department.

Pathologies operated on in the department		Nombre	Pourcentage
Wall pathologies	Inguinal hernia	55	40.44
	Inguinoscrotal hernia	22	16.20
	Strangulated hernia	17	12.50
	White line herniation	7	5.15
	Hernia and hydrocele	10	7.35
	Umbilical hernia	12	8.82
	Spiegel's hernia	1	0.73
	Lipoma	8	5.70
	Others	4	2.94
	Total	136	100
Digestive pathologies	Acute appendicitis	67	55.83
	Peritonitis	24	20
	Occlusion	7	5.83
	Hemorrhoidal thrombosis	10	8.83
	Eventration	8	6.68
	Acute cholecystitis	3	2.50
	Liver abscess	1	0.83
	Total	120	100

Continued

Gyneco-obstetric pathologies	Ovarian Cyst	14	41.18
	Uterine myoma	9	26.47
	Cystocele	5	14.71
	GEU	2	5.88
	Prolapse	2	5.88
	Tubal obstructions	1	2.94
	Intrauterine polyp	1	2.94
	Total	34	100
Urological pathologies	Varicocele	3	30
	Testicular ectopia	3	30
	Elephantiasis	1	10
	Cystocele + rectocele	1	10
	Vesicovaginal fistula	1	10
	After-effects of excision	1	10
	Total	10	100
Total		**300**	**100**

Table 4. Complications according to pathologies, ASA classification and type of complications.

Complications/Pathologies/ASA/Type		Effectif	Fréquence
Pathologies	Wall herniation	4	20
	Acute peritonitis	6	30
	Acute appendicitis	4	20
	Ovarian Cyst	3	15
	Uterine myoma	1	5
	Acute cholecystitis	2	10
ASA classification	ASA I	5	25
	ASA II	8	40
	ASA III	2	10
	ASA IV	5	25
Types of complications	Surgical site infections	15	75
	Necrosis	1	5
	Calcification	1	5
	Hemorrhage	1	5
	Thread rejection	1	5
	Death	1	5
Type of surgical site infection	Superficial	7	46.67
	Deep	7	46.67
	Organic	6	6.67
Total		20	100
Complications by ASA	ASA I	**17**	**85**
	ASA II	2	10
	ASA III	1	5

Table 5. Distribution of complications according to the Clavien and Dindon classification.

Classification of Clavien and Dindon	Effective	Percentage
Grade I	1	5
Grade II	7	35
Grade IIIa	**9**	**45**
Grade IIIb	2	10
Death	1	5
Total	**20**	**100**

Table 6. Isolated germs.

Sprouts	Presence of complications	
	Effective	Percentage
Escherichia coli	**9**	64.30
Staphylococcus aureus	2	14.30
Enterobacter cloacae	1	7.10
Aeromonas hydrophila	1	7.10
Aeromonas sobria	1	7.10
Stérile	6	30
Total	**20**	**100**

Table 7. Adapted antibiotic therapy.

Adapted ATB	Effective	Percentage
Amoxycillin + clavulanic acid	2	10
Imipenem	**3**	**15**
Amoxycillin + clavulanic acid + Nitro	**4**	**20**
Amoxycillin + clavulanic acid + Metro	1	5
Amikacin	1	5
Gentamicin and Imipenem	1	5
Others	2	10
None	6	30
Total	**20**	**100**

Table 8. Surgical treatment.

Surgical treatment	Effective	Percentage
None	1	5
Evacuation + Secondary suture	**17**	**85**
Orchiectomy	2	10
Total	**20**	**100**

Table 9. The additional cost due to the management of the complication.

Additional cost of support in F CFA	Effective	Percentage
[5000 to 25000]	**6**	**30**
[25001 to 50000]	5	25
[50001 to 75000]	4	20
[75001 to 100000]	3	15
[100001 to 125000]	1	5
+125000	1	5
Total	**20**	**100**

4. Discussion

We collected 300 patients aged at least 15 years during a prospective study carried out in the general surgery department of the Cs ref CI Bamako.

Our frequency of postoperative complications, 6.65%, is lower than that observed by the African series (Sylla; Tony) [3] [9], European (Bielecki) [11] and American (Fink) [12] as in Fink and Clavien [13]. These statistical differences may be related to the different definitions of CPO, the limited diagnostic means in our study, the pathologies, the operating techniques and the multiple risk factors.

According to several authors [3] [14] [15] [16], age influences the occurrence of postoperative complications (age over 70 years) [3]. We did not find a statistically significant difference between the average age of our patients (30.35 years) with P = 0.046; lower than that of Proske JM [14], higher than that of the African series (Tony, Eboreime, Assouto) [3] [15] [16]. This difference is explained by the youth of the population of the South of the Sahara in general [9] and Mali in particular [17] and sex would not be a risk factor [7]. Our sex ratio = 2, has no statistically significant difference with P = 0.27; contrasts with that of the literature [10] [18] [19] Emergency intervention is a risk factor which favors the occurrence of postoperative complications according to several authors [3] [9] [10], no statistically significant difference in our series and does not corroborate with those of Tony; Sylla and Assouto; explained by the non-hospitalization of scheduled patients before their intervention and the type of surgery (Class I and II of Alteimeir) whose risk of complications is low (256/300 or 85.33%). This risk would increase by more than 15% from class III [17]. We noted that the risk of occurrence of postoperative complications in Alteimeir classes III + IV was higher in classes I + II (18.92% versus 5.35%) (P = 0.007). Our result is the same as that observed by the African and Medeiros series (the ASA score is a useful indicator according to the literature) [4].

In our study, the ASA classification influenced the occurrence of postoperative complications, ASA III+IV versus ASA I + II (20% vs 6.44%) (P = 0.22), as observed by the African series [9] [10] [17] [20] and Brown SM [16]. Thus our result contrasts with that of the literature [21] [22].

The mortality rate was 5% in our series; zero in France [7]; in the USA [23]

10% in Morocco linked to diagnostic means, medical complications and the high rate of surgical site infections in our study (75%). Infection of the surgical site is the most common type of complication according to the authors [3] [4]. In our study, infection of the surgical site in situ is linked to insufficient means to fight infection, rigorous non-compliance with aseptic and antiseptic measures, delay in diagnosis and treatment.

The classic germs found were Gram-negative bacilli, namely: *Escherichia coli* followed by *Enterobacter cloacae*, *Aeromonas hydrophila*, Aeromonas sobria and a single Gram-positive Cocci, *Staphylococcus aureus*. According to the literature, the germs were found following: *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa*, *Providensia sp* and *Cytobacter freudü* [9] [10].

Quinolones (Ofloxacin), cephalosporins (Ceftazidime), penicillins (Amoxicillin + Clavulanic acid), aminoglycosides (Gentamicin) and carbapenems (Imipenems) were the main antibiotics tested. Only *Enterobacter cloacoe* and *Staphylococcus aureus* were sensitive (100%) to quinolones; all germs resistant to ciprofloxacin; *Escherichia coli*, *Aeromonas hydrophila* and Aeromonas sobria variable sensitivity (22% - 100%) to cephalosporins. *Escherichia coli*, *Staphylococcus aureus* and Aeromonas sobria are sensitive (22% - 100%) to penicillin; all germs sensitive to aminoglycosides (44% - 100%) and carbapenems (100%). The germs raised in the literature were sensitive (70% - 100%) to quinolones, aminoglycosides and cephalosporins. Providensia sp was resistant to penicillins and chloramphenicol unlike Klebsiella pneumoniae which was 100% sensitive [9].

In our study, anemia, Alteimeir class > III, ASA classification > III, duration of surgery and postoperative hospitalization were risk factors for postoperative complications; age, sex and emergency intervention no significant impact on postoperative complications. In the literature, the factors favoring the occurrence of postoperative complications were: age, emergency, Alteimeir classification > III, ASA > III, NISS score, the different rate depending on the authors [3] [5] [7]. The postoperative mortality rate can appear as an objective criterion for assessing and comparing the results of surgical teams and hospitals [4].

Our results do not differ from those observed by Tony [3], Hutter M.M [23] and Gilon J.F [7]. Our mortality rate (0.3%) was lower than that observed by Sylla A. [9]. The average additional cost linked to the management of complications was 60541.85 FCFA (Extremes 5000 and 282752) with a standard deviation of 62455.37 FCFA. This additional cost would be higher than the minimum wage in Mali.

5. Conclusion

Post-operative complications remain frequent despite new non-invasive methods in surgery, the advent of antibiotics and progress made in intensive care anesthesia. They have increased the hospital stay as well as the cost of care. Good pre-resuscitation; per and post operative; good skin preparation; better applica-

tion of surgical techniques; Rigorous compliance with aseptic and antiseptic measures will reduce postoperative complications.

Acknowledgments

To the parents of our patients who have given their informed consent, to the staff of the general surgery department of the CS Ref of commune I of the Bamako district.

Conflicts of Interest

There is no conflict of interest.

References

[1] Penninck, E., Fumery, M., Salleron, J., Savoye, G., Peyrin-Biroudet, L., Turck, D., *et al*. (2011) Complications post opératoires des maladies inflammatoires chroniques de l'intestin à début pédiatrique: Etude en population générale. SNFGE, 146.

[2] Ndayisaba, G., Bazira, L. and Gahongano, G. (1992) Bilan des complications infectieuses en chirurgie générale: Analyse d'une série de 2218 interventions. *Médecine d'Afrique Noire*, **39**, 571-573.

[3] Tonye, T.A., *et al*. (2015) Complications post opératoires précoces dans les hôpitaux du district de la ville de Yaoundé. *Health Sciences and Diseases*, **16**, 1-4. https://www.hsd-fmsb.org

[4] Medeiros, A.C., Aires-Neto, T., Azevedo, G.D., Vilar, M.J.P., Pinheiro, L.A.M. and Brandão-Neto, J. (2005) Surgical Site Infection in a University Hospital in Northeast Brazil. *Brazilian Journal of Infectious Diseases*, **9**, 310-314. https://doi.org/10.1590/s1413-86702005000400007

[5] Biscione, F.M., Couto, R.C. and Pedrosa, T.M.G. (2009) Accounting for Incomplete Postdischarge Follow-Up during Surveillance of Surgical Site Infection by Use of the National Nosocomial Infections Surveillance System's Risk Index. *Infection Control & Hospital Epidemiology*, **30**, 433-439. https://doi.org/10.1086/596732

[6] Petrosillo, N., Drapeau, C.M., Nicastri, E., Martini, L., Ippolito, G. and Moro, M.L. (2008) Surgical Site Infections in Italian Hospitals: A Prospective Multicenter Study. *BMC Infectious Diseases*, **8**, Article No. 34. https://doi.org/10.1186/1471-2334-8-34

[7] Gillion, J. (2005) Le taux brut de mortalité postopératoire est-il un critère pertinent d'efficience d'une équipe chirurgicale? Étude prospective des suites opératoires de 11 756 patients. *Annales de Chirurgie*, **130**, 400-406. https://doi.org/10.1016/j.anchir.2005.01.013

[8] Markus, P.M., Martell, J., Leister, I., Horstmann, O., Brinker, J. and Becker, H. (2005) Predicting Postoperative Morbidity by Clinical Assessment. *British Journal of Surgery*, **92**, 101-106. https://doi.org/10.1002/bjs.4608

[9] Sylla, A. (2012) Complications post opératoires dans le service de chirurgie de l'hôpital Fousseyni Daou de Kayes. Thèse de médecine Bamako, 12M22.

[10] Tchalla, A. (2006) Complications post opératoires précoces dans le service de chirurgie générale de l'hôpital Gabriel TOURE. Thèse de médecine, Bamako 06M108.

[11] Bielecki, K. and Rud, P.M. (2006) Postoperative Complications in a Teaching Surgical Ward. *Polski Merkuriusz Lekarski*, **20**, 413-415.

[12] Fink, A.S., Hutter, M.M., Campbell, D.C., Henderson, W.G., Mosca, C. and Khuri,

S.F. (2007) Comparison of Risk-Adjusted 30-Day Postoperative Mortality and Morbidity in Department of Veterans Affairs Hospitals and Selected University Medical Centers: General Surgical Operations in Women. *Journal of the American College of Surgeons*, **204**, 1127-1136. https://doi.org/10.1016/j.jamcollsurg.2007.02.060

[13] Clavien, P.A., Barkun, J., de Oliveira, M.L., Vauthey, J.N., Dindo, D., Schulick, R.D., *et al*. (2009) The Clavien-Dindo Classification of Surgical Complications. *Annals of Surgery*, **250**, 187-196. https://doi.org/10.1097/sla.0b013e3181b13ca2

[14] Proske, J.M., Raue, W., Neudecker, J., Müller, J.M. and Schwenk, W. (2005) Réhabilitation rapide en chirurgie colique: Résultats d'une étude prospective. *Annales de Chirurgie*, **130**, 152-156. https://doi.org/10.1016/j.anchir.2004.12.012

[15] Eboreime, O., Asogun, Z.I., Ahonsi, B., Momoh, M. and Ohanaka, E.C. (2011) Fistule entérocu-tanée: Une complication postopératoire évitable. https://www.wacsabidjan2011.org

[16] Assouto, P., Tchaou, B. and Kangni, N. (2009) Evolution post opératoire précoce en chirurgie digestive en milieu tropical. *Médecine Tropicale A*, **69**, 477-479.

[17] Traoré, A., Diakité, I., Dembélé, B.T., Togo, A., Kanté, L., Diallo, G., *et al*. (2011) Complications post opératoires en chirurgie abdominale au CHU Gabriel TOURE. *Médecine d'Afrique Noire*, **58**, 31-35.

[18] Chichom Mefire, A., Tchounzou, R., Masso Misse, P., Pisoh, C., Pagbe, J.J., Essomba, A., *et al*. (2009) Réinterventions de chirurgie abdominale en milieu défavorisé: Indications et suites opératoires (238 cas). *Journal de Chirurgie*, **146**, 387-391. https://doi.org/10.1016/j.jchir.2009.08.018

[19] Anderson, D.J., Chen, L.F., Sexton, D.J. and Kaye, K.S. (2008) Complex Surgical Site Infections and the Devilish Details of Risk Adjustment: Important Implications for Public Reporting. *Infection Control & Hospital Epidemiology*, **29**, 941-946. https://doi.org/10.1086/591457

[20] Dem, A., Kasse, A.A., Diop, M., Fall, M.C., Diop, P.S., Dotou, C., *et al*. (2001) Colpohystérectomies élargies avec lymphadenectomies pour cancer du col utérin à l'institut du cancer de Dakar: À propos de 412 cas. *Dakar Médical*, **46**, 39-42.

[21] Wasowiez, D.K., Schwitz, R.F. and Go, P.M. (2000) Assessment of Day Surgery in a District Training Hospital: Safety, Efficacy and Patient's Satisfaction. *Nederlands Tijdschrift voor Geneeskunde*, **29**, 64-85.

[22] Mutter, D. and Marescaux, J. (2002) Complications des gastrectomies. Encycl Med Chir (Editions Scientifiques et Médicales Elsevier SAS, Paris), Techniques Chirurgicales-Appareil digestif, 40-350, 19.

[23] Hutter, M.M., Rowell, K.S., Devaney, L.A., Sokal, S.M., Warshaw, A.L., Abbott, W.M. and Hodin, R.A. (2007) Identification of Surgical Complications and Deaths: An Assessment of the Traditional Surgical Morbidity and Mortality Conference Compared with the American College of Surgeons National Surgical Quality Improvement Program. *Journal of the American College of Surgeons*, **204**, 400-406.