

# Post-operative hospitalization in retinal detachment correlation to recurrences

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## Abstract

**Purpose.** To evaluate relationships between the incidence of re-detachment and post-operative days of hospitalization in patients with diagnosis of retinal detachment (RD) who underwent surgery either through ab-externo approach (scleral buckling and encircling) or ab-interno approach (vitrectomy and oil-gas tamponade).

**Methods.** This retrospective study included 268 patients (268 eyes) with diagnosis of primary RD: 127 males (47%) and 141 (53%) females, mean age of  $64.1 \pm 17.3$  years. 46 patients (17%) underwent a surgical ab-externo approach (group A), while 222 patients (83%) underwent an ab-interno surgical approach. Each RD was graded according to the "Retinal detachment grading system of Royal College of Ophthalmologists" and treated within 5 days after diagnosis. The redetachment (RT) related to a surgical failure was considered within 30 days after first operation.

**Results.** In the group 1 without night hospitalization (day surgery) global RT rate was 3.5% (4.17% for ab-interno technique and 0% for ab-externo techniques). In the group 2 with one day of hospitalization global RT rate was 1.33% (1.49% for ab-interno technique and 0% for ab-externo techniques). In the group 3 with 2 days of hospitalization global RT rate was 3.80% (4.62% for ab-interno techniques and 0% for ab-externo techniques). In the group 4 with 3 or more days of hospitalization global RT rate was 12.28% (14.29% for ab-interno techniques for 6.67% ab-externo techniques). The incidence of RT in group 1, day surgery, is comparable to the other groups and it is less compared to group 4 (3 or more days of hospitalization).

**Conclusions.** The incidence of retinal redetachment (RRD) is not increased in day surgery mode. These data support outpatient management of RD patients to reduce medical cost and problems related to the hospitalization. Further studies are needed for patients' security.

## Key words

- hospitalization
- post-operative stay
- recurrences
- retinal detachment
- retinal redetachment

## INTRODUCTION

Primary retinal detachment (RD) incidence has been reported to be between 6.3 and 17.9 per 100 000 population [1]. It is a threatening condition that can lead patients to a complete vision loss; this is usually due to recurrence of primary lesion caused by retinal holes or tears in peripheral (equatorial or pre equatorial) areas. Surgical treatment must be as more rapid as possible to preserve a better visual outcome of patients and to reduce the incidence of vitreoretinal (VR) proliferations that usually lead to RD. Surgical technique normally is based on two approaches: ab-externo techniques with silicone band encircling also associated to scleral buckling in order to close the retinal

break; ab-interno technique is based on a vitrectomy procedure, with surgical removal of vitreous from the inner of the eye and internal retinal tears closure and treatment with endolaser probes followed by tamponade with air, gas bubble or silicon oil.

Retinal redetachment (RRD) is a complication that can occur after treatment of RD both after encircling and scleral buckling or vitrectomy for many reasons (incomplete retinal tear closures, persistency of retinal tractions, persistency of subretinal fluid and VR proliferations). If surgical procedure is incomplete or if there is an early mobilization of the eye, patient may have a surgical failure and a recurrence of RD and generally this is considered by

most surgeons as a directly consequence to primary intervention if it appears within 30 days after primary surgical procedure.

With both techniques post-operative patient hospitalization lasts usually few days (two or three), this time was considerably reduced in the last 5 years thanks to microincisional vitrectomy techniques (MIVS) also considering the high cost of every single day of medical care in hospital in an ophthalmologic ward even if a wide debate is still ongoing in consideration of new view of health services that tends to reduce inpatient hospitalization in order to decrease the cost for the community and to improve quality of life of VR surgical patient in term of blinding psychological impact. In the ophthalmological and health care management literature there are few data about the hospitalization for a short or a long time (one or more days after the surgery) and the head and body positioning after the surgery.

The goal of our present study is to evaluate if there are any relationships between post operative hospitalization and redetachment (RT) rate and if there is a difference between the two different approaches.

## MATERIALS AND METHODS

The authors retrospectively studied a group of 211 patients (211 eyes) with diagnosis of naïve primary RD, hospitalized in the Ophthalmologic Unit of "Santa Maria Goretti Hospital" (Dipartimento di Oftalmologia, Ospedale "Santa Maria Goretti"), Italy in Latina starting from June 2010 to November 2012. The patients underwent different surgical approaches chosen by the surgeon. RT was considered related to an incomplete surgical procedure or to an inappropriate care of the patient if the patient was rehospitalized within 30 days after the first surgery.

Eyes with primary RD with 1-7 day of symptoms onset, without previously performed retinal laser treatments were included in the study, each patient was evaluated with preoperative visit including stereoscopic indirect fundus examination, RD gravity was graded according to "Retinal detachment grading system" by Thompson, *et al.* (Table 1) [11].

Data were collected analyzing the electronic report from SIO (hospital informative system) that is a computerized file report software in which all data of diagnosis, surgical techniques and hospitalization were stored. Since diagnosis and treatment were reported in ICD-9 codes, data were decoded. Collected data were checked again, matching those to clinical files report. Days of hospitalization were determined considering days between the day of surgery and the day of discharge. For each patient the informed consent was obtained according Helsinki declara-

tion. This retrospective study started from June 2010 until November 2012 (from August 2012 surgery is performed in day surgery mode according to Italian National Health Service guidelines), included 268 eyes with first diagnosis of macula off RD episode of 268 patients: 127 males (47%) and 141 (53%) females; mean age of  $64.1 \pm 17.3$  years. 46 patients (17%) underwent a surgical ab-externo approach, on the other hand 222 patients (83%) underwent a surgical ab-interno approach.

Each patient was graded in four steps according to the "Retinal detachment grading system of Royal College of Ophthalmologists" (Table 1) and surgical intervention was performed within 5 days after diagnosis due to general condition of the patient in peribulbar anesthesia. The surgeon and the operatory theatre were the same for all procedures (EMV). Patients were divided into four homogeneous groups depending on the days of post-operative hospitalization: group 1 without night hospitalization (day surgery) consists of 57 "1-4 grades" patients (21%, 48 ab-interno and 9 ab-externo); group 2 with one day of hospitalization consists of 75 "grade 1-2" patients (28%, 67 ab-interno and 8 ab-externo), group 3 with 2 days of hospitalization consists of 79 "grade 1-3" patients (29%, 65 ab-interno and 14 ab-externo) and group 4 with 3 or more days of hospitalization consists of 57 "grade 1-4" patients (21%, 42 ab-interno and 15 ab-externo). Phakic patients underwent a combine operation of cataract extraction and pars plana vitrectomy (PPV), so after the surgery all patients were pseudophakic. No patients received in the same time SB and PPV. The tamponade agent, used in ab interno procedure, was 1000cs silicone oil (SO). RRD was considered if it was diagnosed within 30 days after surgery. Statistical analysis was performed with ANOVA multivariate analysis significant level was  $p < 0.05$ .

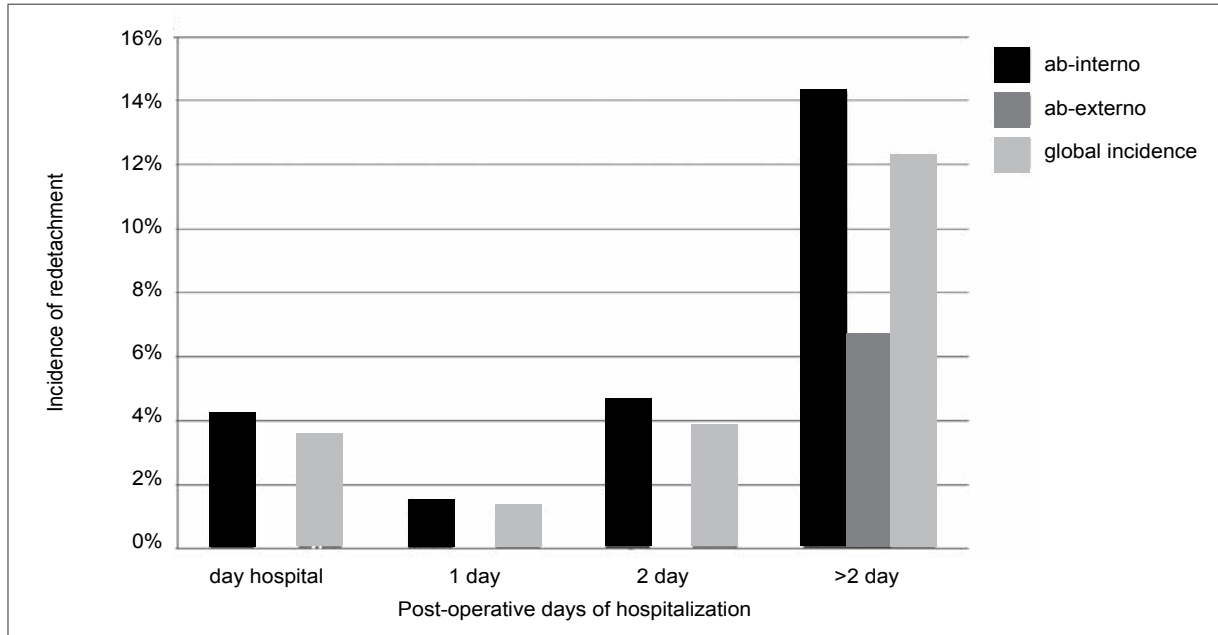
## RESULTS

Single operation success rate (SOSR) of present data, obtained by the surgeon, for ab-interno techniques was 94.25%, and for ab-externo was 97.30%. In the group without hospitalization global RT rate was 3.5% (4.17% for ab-interno technique and 0% for ab-externo techniques). In the group with one day of hospitalization global RT rate was 1.33% (1.49% for ab-interno technique and 0% for ab-externo techniques). In the group with two days of hospitalization global RT rate was 3.80% (4.62% for ab-interno techniques and 0% for ab-externo techniques). In the group with three or more days of hospitalization global RT rate was 12.28% (14.29% for ab-interno techniques for 6.67% ab-externo techniques). Group without day of hospitalization incidence of RT is comparable to other groups and less than group with three or more days of hospitaliza-

**Table 1**

Retinal detachment (RD) grading system according to the Royal College of Ophthalmologists. Modified from [11]

Grade	Description of retinal detachment gravity
1	A single retinal break and less than one quadrant of RD.
2	Single or multiple breaks within the same quadrant with less than two quadrants of RD.
3	Breaks limited to two quadrants and/or three or more quadrants of RD.
4	Any complex break including giant tears or extensive proliferative vitreoretinopathy or a RD not covered by the above grades.



**Figure 1**

Cumulative redetachment (RT) incidence correlated with hospitalization stay. Relationship between days of post-operative hospitalization and incidence of retinal redetachment (RRD) in ab-interno, ab-externo approaches and global incidence.

tion (chi square index =  $8.31 \cdot 10^{-6}$ ;  $p < 0.01$  CI = 95%). The average of global incidence for groups 1-3 (5.80%) (day surgery or with 1-2 days of hospitalization) is more than the global incidence for group A (3.50% day surgery) (Figure 1). Group with three or more days of hospitalization have a much higher RT, because in this group there are more severe detachment cases with more severe pathology (complex break, giant tears, already developed proliferative vitreoretinopathy). However this difference is not statistically significant. Differences between groups were not significant.

## DISCUSSION

Average SOSR for RD surgery in literature is reported in average at 85.54% [2] with a variation between 71% and 98%. The authors reported in this study a SOSR of 94.25%, this value is in accordance with limits described by other papers. Moreover several studies in literature have demonstrated the attention of scientific world to the problem of RT but no authors until now have focused the attention on the time delay immediately after first surgical operation and relationships to hospital stay.

There are several papers in scientific literature that point out several factors involved in RRD. An important factor involved in RRD is the timing of removal of silicon oil. After the surgical removal of silicon oil tamponade the incidence of RT was reported to be 3.46% [3]. Jonas *et al.* referred that the risk of RRD decreases steeply with increasing time after SO removal. Three to 5 months after oil removal, RRD becomes unlikely [4]. An other important factor involved in RT is a following cataract extraction or laser capsulotomy even if a previous scleral buckling can protect against RRD [5]. About the postoperative stay Wilson, *et al.* [6] reported a comparable outcome between VR patients treated with and without long hospitalization but not considering pre and post operative stay. Another

study focuses the attention on the timing of keeping a particular position after VR surgery. This study concluded that head position is determinant for visual outcome during the first night following the operation [7]. Our study indeed demonstrates that hospital stay has no influence in postoperative success of the operation even in consideration of mid-term observation follow up, our patients were free in head position and bed stay after the surgery.

In our opinion post operative staying is an important problem for patients and for economic assessment due to post surgery hospitalization and implies several considerations on intervention costs and reimbursement and on long term sustainability of ophthalmological care of this kind of patients.

Present data allows the consideration that nowadays with new MIVS (23G and 25G) but also with modern techniques for ab-externo surgery, considered in this study, long hospitalization has not rationale to be performed.

Moreover hospitalization is very expensive for patients in term of quality of life, considering that hospital stay tends to remove from family, work or environment, depressing psychic conditions and all of them can lead to a further reduction of vision or bad reaction to the surgery discomfort and not compliance in therapy or follow-up specially older subjects.

Hospitalization is an important impact on sanitary budget. Due to low intensity medical care, as in Ophthalmological Department, in Italy average daily cost of hospitalization is about 630 Euro (ASSR, Associazione Sanitaria e Sociale Regionale, 2009). Sustainability of those may have a sense if there is a significant gain in reduction of RT rate (with lower medical expenses) or in patient satisfaction (improvement of quality of postoperative safety), but data from our study seems to demonstrate the opposite.

Moreover we have to consider that hospitalization is related with an increased rate of nosocomial infections,

in particular pneumonia, hard to treat [8] and finally reduced mobility or prolonged bed stay may favour venous thromboembolism and this is another important problem related with keeping a bed position for a long time, especially during a long hospitalization as was usual until some years ago, in our opinion reducing hospitalization stay or forced head position may reduce this risk (none of our patients experienced thromboembolic accident) [9].

Finally older patients are more exposed to nosocomial infection because of co-morbidity linked to chronic diseases (diabetes, hypertension, heart diseases, kidney failure, etc.), when hospitalized for RD they may get sick from superimposed nosocomial infections of urinary tract or lung diseases, and this lead to a prolonged stay in hospital and sometimes to other complications. In addition to that, hospitalization is related with a problem of crowded medical ward in which patients that do not need hospitalization or staying, cause problems of delay in operations and organization. Patients' families may have to support their relatives during hospitalization causing job-absence resulting in indirect and sometimes higher social costs that must be added to those directly due to the medical needs of the patients.

Patients' post-operative time is more comfortable if it is spent in their home and all considered post-operative therapy is often based only on administration of eye-drops (mydriatic, antibiotic and anti-inflammatory drugs) that can be used easily at home. Older patients, during hospitalization, feel the discomfort of staying in a room which is different from that they use to have in their home, living with other people in rooms in which relatives are not allowed to be with them at anytime and have to follow strictly rules and times established by the hospital, so most of them experiment social isolation, especially if they live in family or have a poor economic status [10, 11]. Old patients are also prone to develop pressure ulcers or to disequilibrate previously masked psychological pathologies as depression or bipolar disturbances.

This study evidenced that there is no significant difference in reattachment outcome among the groups inde-

pendently from RD severity therefore more days of hospitalization after intervention are not useful to improve or obtain retinal adhesion, increase visual outcome or reduce risk recurrences after RD, in according to other papers [6, 7]. Unexpectedly we have noted that patients with less days of hospitalization after surgical operation have less incidence of RRD even in presence of similar grade of severity of RD. This is convenient for budget in public health system and for patients' quality of life because they can return to home in a brief time and it is also useful for their outcome. Moreover spared resources may be employed to increase success rate in other challenging retinal diseases.

## CONCLUSIONS

Our study indicates that the incidence of RRD is reduced or is equal in patients with less days of hospitalization after surgical operation. The incidence of RRD does not increase if the patient is hospitalized. Slight increase of recurrence rate but not significant there is if ophthalmological care is given in day surgery mode. These data support outpatient management of RD in order to have a better outcome and reduce medical cost improve their quality of life and minimize social costs or loss of days of work for their relatives. Further studies are desirable to confirm our findings with a multicentric study involving more surgeons and more patients.

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## Conflict of interest statement

There are no potential conflicts of interest or any financial or personal relationships with other people or organizations that could inappropriately bias conduct and findings of this study.

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