



HAL
open science

Étude comparative de la vitrectomie transconjonctivale sans suture 23 gauge versus 20 gauge dans la chirurgie du décollement de rétine

Magali Albrieux

► **To cite this version:**

Magali Albrieux. Étude comparative de la vitrectomie transconjonctivale sans suture 23 gauge versus 20 gauge dans la chirurgie du décollement de rétine. Médecine humaine et pathologie. 2010. dumas-00626530

HAL Id: dumas-00626530

<https://dumas.ccsd.cnrs.fr/dumas-00626530>

Submitted on 1 Oct 2013

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

AVERTISSEMENT

Ce document est le fruit d'un long travail approuvé par le jury de soutenance et mis à disposition de l'ensemble de la communauté universitaire élargie.

Il n'a pas été réévalué depuis la date de soutenance.

Il est soumis à la propriété intellectuelle de l'auteur. Ceci implique une obligation de citation et de référencement lors de l'utilisation de ce document.

D'autre part, toute contrefaçon, plagiat, reproduction illicite encourt une poursuite pénale.

Contact au SICD1 de Grenoble : **thesebum@ujf-grenoble.fr**

LIENS

Code de la Propriété Intellectuelle. articles L 122. 4

Code de la Propriété Intellectuelle. articles L 335.2- L 335.10

http://www.cfcopies.com/V2/leg/leg_droi.php

<http://www.culture.gouv.fr/culture/infos-pratiques/droits/protection.htm>



Ex. 2

UNIVERSITE JOSEPH FOURIER
FACULTE DE MEDECINE DE GRENOBLE

Année 2010

N° 5052

**Etude comparative de la vitrectomie transconjonctivale sans suture
23 gauge versus 20 gauge dans la chirurgie du décollement de rétine**

THESE

PRESENTEE POUR L'OBTENTION DU DOCTORAT EN MEDECINE

DIPLÔME D'ETAT

Magali ALBRIEUX

Née le 6 Décembre 1980 à Lyon 4^{ème}

THESE SOUTENUE PUBLIQUEMENT A LA FACULTE DE MEDECINE DE GRENOBLE

Le jeudi 9 Septembre 2010

Devant le jury composé de :

Président du jury : **M. le Professeur Jean Paul ROMANET**

Directeur de thèse : **M. le Professeur Christophe CHIQUET**

Membres : **M. le Professeur Gilles THURET (St Étienne)**

M. le Docteur Frédéric ROUBEROL (Lyon)

Me le Docteur Karine PALOMBI (Grenoble)



NOM	PRENOM	ADRESSE
ALBALADEJO	Pierre	CLINIQUE D'ANESTHESIE PÔLE 2 ANESTHESIE - REANIMATIONS
ARVIEUX-BARTHELEMY	Catherine	CLINIQUE DE CHIRURGIE ET DE L'URGENCE POLE 6 DIGIDUNE
BACONNIER	Pierre	BIostatISTIQUES ET INFORMATIQUE MEDICALE PAVILLON D POLE 17 SANTE PUBLIQUE
BAGUET	Jean-Philippe	CLINIQUE DE CARDIOLOGIE / HYPERTENSION ARTERIELLE POLE 4 CARDIO VASC. & THORACIQUE
BALOSSO	Jacques	RADIOTHERAPIE PÔLE 5 CANCEROLOGIE
BARRET	Luc	CLINIQUE MEDECINE LEGALE POLE 8 PLURIDISCIPLINAIRE DE MEDECINE
BAUDAIN	Philippe	CLINIQUE RADIOLOGIE ET IMAGERIE MEDICALE POLE 13 IMAGERIE
BEANI	Jean-Claude	CLINIQUE DERMATOLOGIE-VENERELOGIE- PHOTOBIOLOGIE ET ALLERGOLOGIE POLE 8 PLURIDISCIPLINAIRE DE MEDECINE
BENHAMOU	Pierre Yves	CLINIQUE ENDOCRINO DIABETO NUTRITION EDUCATION THERAPEUTIQUE/ DIABETOLOGIE - POLE 6 DIGIDUNE
BERGER	François	ONCOLOGIE MEDICALE POLE 5 CANCEROLOGIE
BLIN	Dominique	CLINIQUE CHIRURGIE CARDIAQUE POLE 4 CARDIO VASC. & THORACIQUE
BOLLA	Michel	CENTRE COORD. CANCEROLOGIE POLE 5 CANCEROLOGIE
BONAZ	Bruno	CLINIQUE HEPATO-GASTRO- ENTEROLOGIE POLE 6 DIGIDUNE
BOSSON	Jean-Luc	DPT DE METHODOLOGIE DE L'INFORMATION DE SANTE POLE 17 SANTE PUBLIQUE
BOUGEROL	Thierry	PSYCHIATRIE D'ADULTES - PAVILLON D. VILLARS POLE 10 PSYCHIATRIE & NEUROLOGIE
BRAMBILLA	Elisabeth	DPT ANATOMIE & CYTOLOGIE PATHOLOGIQUES POLE 14 BIOLOGIE
BRAMBILLA	Christian	CLINIQUE DE PNEUMOLOGIE POLE 7 MEDECINE AIGÛE & COMMUNAUTAIRE
BRICHON	Pierre-Yves	CLINIQUE DE CHIRURGIE VASCULAIRE ET THORACIQUE POLE 4 CARDIO VASC. & THORACIQUE
BRIX	Muriel	CLINIQUE CHIR. MAXILLO-FACIALE POLE 3 TETE & COU & CHIR. REPARATRICE
CAHN	Jean-Yves	CANCEROLOGIE POLE 5 CANCEROLOGIE
CARPENTIER	Patrick	CLINIQUE MEDECINE VASCULAIRE POLE 8 PLURIDISCIPLINAIRE DE MEDECINE
CARPENTIER	Françoise	CLINIQUE URGENCE POLE 1 SAMU SMUR
CESBRON	Jean-Yves	IMMUNOLOGIE - BATIMENT J. ROGET FAC MEDECINE POLE 14 BIOLOGIE
CHABARDES	Stephan	Clinique de Neurochirurgie
CHABRE	Olivier	CLINIQUE ENDOCRINO DIABETO NUTRITION EDUCATION THERAPEUTIQUE / ENDOCRINOLOGIE POLE 6 DIGIDUNE
CHAFFANJON	Philippe	CLINIQUE CHIRURGIE THORACIQUE, VASCULAIRE ET ENDOCRINIENNE
CHAVANON	Olivier	CLINIQUE DE CHIRURGIE CARDIAQUE POLE 4 CARDIO VASC. & THORACIQUE

CHIQUET	Christophe	CLINIQUE OPHTALMOLOGIQUE POLE 3 TETE & COU & CHIR. REPARATRICE
CHIROSSSEL	Jean-Paul	ANATOMIE - FACULTE DE MEDECINE POLE 3 TETE & COU & CHIR. REPARATRICE
CINQUIN	Philippe	DPT D'INNOVATIONS TECHNOLOGIQUES- POLE 17 SANTE PUBLIQUE
COHEN	Olivier	DELEGATION - HC FORUM (création entreprise) - rémunération universitaire conservée
COUTURIER	Pascal	CLINIQUE MEDECINE GERIATRIQUE POLE 8 PLURIDISCIPLINAIRE DE MEDECINE
CRACOWSKI	Jean-Luc	Laboratoire de Pharmacologie
DE GAUDEMARIS	Régis	DPT MEDECINE & SANTE DU TRAVAIL POLE 17 SANTE PUBLIQUE
DEBILLON	Thierry	CLINIQUE REA. & MEDECINE NEONATALE POLE 9 COUPLE/ENFANT
DEMONGEOT	Jacques	BIostatistiques ET INFORMATIQUE MEDICALE POLE 17 SANTE PUBLIQUE
DESCOTES	Jean-Luc	CLINIQUE UROLOGIE POLE 6 DIGIDUNE
DYON	J.François	
ESTEVE	François	Dir. Equipe 6 U836 - ID17 /ESRF Grenoble Institut des Neurosciences
FAGRET	Daniel	CLINIQUE DE MEDECINE NUCLEAIRE POLE 13 IMAGERIE
FAUCHERON	Jean-Luc	CLINIQUE DE CHIRURGIE DIGESTIVE ET DE L'URGENCE POLE 6 DIGIDUNE
FAVROT	Marie Christine	DPT DE BIOLOGIE INTEGREE / CANCEROLOGIE POLE 14 BIOLOGIE
FERRETTI	Gilbert	CLINIQUE RADIOLOGIE & IMAGERIE MEDICALE POLE 13 IMAGERIE
FEUERSTEIN	Claude	GIN
FONTAINE	Eric	CLINIQUE NUTRITION ARTIFICIELLE POLE 7 MED. AIGÛE & COMMUNAUTAIRE
FRANCO	Alain	CLINIQUE VIEILLISSEMENT ET HANDICAP POLE 7 MED. AIGUE & COMMUNAUTAIRE
FRANCOIS	Patrice	DPT DE VEILLE SANITAIRE POLE 17 SANTE PUBLIQUE
GARNIER	Philippe	
GAUDIN	Philippe	CLINIQUE DE RHUMATOLOGIE POLE 11 APPAREIL LOCOMOTEUR GERIATRIE CHISSE
GAY	Emmanuel	CLINIQUE NEUROCHIRURGIE POLE 3 TETE & COU & CHIR. REPARATRICE
GIRARDET	Pierre	
GUIDICELLI	Henri	
HALIMI	Serge	CLINIQUE ENDOCRINO-DIABETO-NUTRITION POLE 6 DIGIDUNE
HOMMEL	Marc	CLINIQUE DE NEUROLOGIE POLE 10 PSYCHIATRIE & NEUROLOGIE
JOUK	Pierre-Simon	DEPARTEMENT GENETIQUE ET PROCREATION POLE 9 COUPLE/ENFANT
JUVIN	Robert	CLINIQUE DE RHUMATOLOGIE - HOPITAL SUD POLE 11 APPAREIL LOCOMOTEUR & GERIATRIE CHISSE
KAHANE	Philippe	CLINIQUE DE NEUROLOGIE POLE 10 PSYCHIATRIE & NEUROLOGIE
KRACK	Paul	CLINIQUE DE NEUROLOGIE POLE 10 PSYCHIATRIE & NEUROLOGIE
KRAINIK	Alexandre	CLINIQUE NEURORADIOLOGIE & IRM POLE 13 IMAGERIE

LANTUEJOUL	Sylvie	DEPARTEMENT D'ANATOMIE ET CYTOLOGIE PATHOLOGIQUES PÔLE 14 BIOLOGIE
LE BAS	Jean-François	CLINIQUE NEURORADIOLOGIE & IRM POLE 13 IMAGERIE
LEBEAU	Jacques	CLINIQUE CHIR. MAXILLO-FACIALE POLE 3 TETE & COU & CHIR. REPARATRICE
LECCIA	Marie-Thérèse	CLINIQUE DERMATOLOGIE-VENEREOLOGIE- PHOTOBIOLOGIE ET ALLERGOLOGIE POLE 8 PLURIDISCIPLINAIRE DE MEDECINE
LEROUX	Dominique	DEPARTEMENT BIOLOGIE ET PATHOLOGIE DE LA CELLULE POLE 14 BIOLOGIE
LEROY	Vincent	CLINIQUE D'HEPATO GASTRO ENTEROLOGIE POLE 6 DIGIDUNE
LETOUBLON	Christian	CLINIQUE CHIRURGIE DIGESTIVE & URGENCE POLE 6 DIGIDUNE
LEVERVE	Xavier	LABORATOIRE THERAPEUTIQUE UFR BIOLOGIE BAT 72 UJF BP 53X
LEVY	Patrick	PHYSIOLOGIE POLE 12 REEDUCATION & PHYSIOLOGIE
LUNARDI	Joël	BIOCHIMIE ADN- POLE 9 COUPLE/ENFANT
MACHECOURT	Jacques	CLINIQUE DE CARDIOLOGIE POLE 4 CARDIO VASC. & THORACIQUE
MAGNE	Jean-Luc	CLINIQUE CHIRURGIE VASCULAIRE & THORACIQUE POLE 4 CARDIO VASC. & THORACIQUE
MAITRE	Anne	Médecine du travail EPSP/DPT DE BIOLOGIE INTEGREE - POLE 14 BIOLOGIE - J.ROGET 4e ETAGE
MALLION	J. Michel	
MASSOT	Christian	CLINIQUE MEDECINE INTERNE POLE 8 PLURIDISCIPLINAIRE DE MEDECINE
MAURIN	Max	DEPARTEMENT DES AGENTS INFECTIEUX / BACTERIOLOGIE POLE 14 BIOLOGIE
MERLOZ	Philippe	CLINIQUE CHIR. ORTHOPEDIE TRAUMATOLOGIE POLE 3 TETE & COU & CHIR. REPARATRICE
MORAND	Patrice	DPT DES AGENTS INFECTIEUX / VIROLOGIE POLE 14 BIOLOGIE
MOREL	Françoise	
MORO-SIBILOT	Denis	
MOUSSEAU	Mireille	ONCOLOGIE MEDICALE POLE 5 CANCEROLOGIE
MOUTET	François	CHIR. PLASTIQUE ET RECONSTRUCTRICE ET ESTHETIQUE
PASQUIER	Basile	
PASSAGIA	Jean-Guy	ANATOMIE POLE 3 TETE & COU & CHIR. REPARATRICE
PAYEN DE LA GARANDERIE	Jean-François	CLINIQUE REANIMATION POLE 2 ANESTHESIE-REANIMATION
PELLOUX	Hervé	DEPARTEMENT DES AGENTS INFECTIEUX PARASITOLOGIE ET MYCOLOGIE POLE 14 BIOLOGIE
PEPIN	Jean-Louis	CLINIQUE PHYSIOLOGIE SOMMEIL & EXERCICE - POLE 12 REEDUCATION & PHYSIOLOGIE
PERENNOU	Dominique	SERVICE DE REEDUCATION POLE 12 REEDUCATION & PHYSIOLOGIE
PERNOD	Gilles	CLINIQUE DE MEDECINE VASCULAIRE- POLE PLURIDISCIPLINAIRE DE MEDECINE - POLE 8
PIOLAT	Christian	Clinique de chirurgie infantile
PISON	Christophe	CLINIQUE PNEUMOLOGIE POLE 7 MEDECINE AIGÛE & COMMUNAUTAIRE
PLANTAZ	Dominique	CLINIQUE MEDICALE PEDIATRIQUE POLE 9 COUPLE/ENFANT

POLACK	Benoît	DEPARTEMENT DE BIOLOGIE ET PATHOLOGIE DE LA CELLULE POLE 14 BIOLOGIE
POLLAK	Pierre	NEUROLOGIE POLE 10 PSYCHIATRIE & NEUROLOGIE
PONS	Jean-Claude	CLINIQUE UNIVERSITAIRE GYNECOLOGIE OBSTETRIQUE POLE 9 COUPLE/ENFANT
RAMBEAUD	J Jacques	CLINIQUE UROLOGIE POLE 6 DIGIDUNE
REYT	Emile	CLINIQUE O.R.L. POLE 3 TETE & COU & CHIR. REPARATRICE
ROMANET	J. Paul	CLINIQUE OPHTALMOLOGIQUE POLE 3 TETE & COU & CHIR. REPARATRICE
SARAGAGLIA	Dominique	CLINIQUE ORTHOPEDIQUE ET TRAUMATOLOGIE POLE 11 APPAREIL LOCOMOTEUR & GERIATRIE CHISSE HOPITAL SUD
SCHAAL	Jean-Patrick	CLINIQUE UNIVERSITAIRE GYNECOLOGIE OBSTETRIQUE POLE 9 COUPLE/ENFANT
SCHMERBER	Sébastien	CLINIQUE O.R.L. POLE 3 TETE & COU & CHIR. REPARATRICE
SEIGNEURIN	Daniel	DPT ANATOMIE & CYTOLOGIE PATHOLOGIQUES POLE 14 BIOLOGIE
SEIGNEURIN	Jean- Marie	DPT AGENTS INFECTIEUX POLE 14 BIOLOGIE
SELE	Bernard	DPT GENETIQUE & PROCREATION POLE 9 COUPLE/ENFANT
SESSA	Carmine	CHIRURGIE THORACIQUE VASCULAIRE POLE 4 CARDIO VASC. & THORACIQUE
SOTTO	Jean-Jacques	
STAHL	Jean-Paul	CLINIQUE INFECTIOLOGIE POLE 7 MEDECINE AIGÛE & COMMUNAUTAIRE
TIMSIT	Jean-François	CLINIQUE REANIMATION MEDICALE POLE 7 MED. AIGUE & COMMUNAUTAIRE
TONETTI	Jérôme	CLINIQUE ORTHOPEDIQUE ET TRAUMATOLOGIE POLE 11 APPAREIL LOCOMOTEUR & GERIATRIE CHISSE
TOUSSAINT	Bertrand	BIOCHIMIE ET BIOLOGIE MOLECULAIRE POLE 14 BIOLOGIE
VANZETTO	Gérald	CLINIQUE DE CARDIOLOGIE POLE 4 CARDIO VASC. & THORACIQUE
VUILLEZ	Jean-Philippe	BIOPHYSIQUE ET TRAITEMENT DE L'IMAGE
ZAOUI	Philippe	CLINIQUE NEPHROLOGIE POLE 6 DIGIDUNE
ZARSKI	Jean-Pierre	CLINIQUE HEPATO-GASTRO-ENTEROLOGIE POLE 6 DIGIDUNE

BOLLA	Michel	Du 13/06/09 au 31/08/2012
DYON	J.François	(surnombre)
GARNIER	Philippe	(surnombre)
GIRARDET	Pierre	(surnombre)
GUIDICELLI	Henri	(surnombre)
MALLION	J. Michel	(surnombre)
MOREL	Françoise	Surnombre depuis le 08/08/2008 --> 31/08/2011
PASQUIER	Basile	(surnombre)
SEIGNEURIN	Jean-Marie	Du 11/02/09 au 31/12/2012
SOTTO	Jean-Jacques	(surnombre)

NOM	PRENOM	ADRESSE
BOTTARI	Serge	Département de Biologie Intégrée Pôle 14: Biologie
BOUTONNAT	Jean	Département de Biologie et Pathologie de la Cellule - Pôle 14: Biologie
BRENIER-PINCHART	M.Pierre	Département des agents infectieux Parasitologie Mycologie Pôle 14: Biologie
BRICAULT	Ivan	Clinique de radiologie et imagerie médicale Pôle 13: Imagerie
BRIOT	Raphaël	Pôle Urgence SAMU
CALLANAN-WILSON	Mary	Génétique IAB
CARAVEL	Jean-Pierre	Clinique de médecine Nucléaire Pôle 13: Imagerie
CRACOWSKI	Jean Luc	Laboratoire de Pharmacologie
CROIZE	Jacques	Département des agents infectieux Microbiovigilance Pôle 14: Biologie
DEMATTEIS	Maurice	Clinique de physiologie sommeil et exercice Pôle 12: Rééducation et physiologie
DERANSART	Colin	GIN - BATIMENT E. SAFRA Equipe 9
DETANTE	Olivier	Clinique de Neurologie
DROUET	Christian	Département de Biologie et Pathologie de la Cellule Centre angiodème - Pôle 14: Biologie
DUMESTRE-PERARD	Chantal	Immunologie - BATIMENT J. ROGET.
EYSSERIC	Héliène	Clinique de Médecine Légale Pôle 8: Pôle Pluridisciplinaire de Médecine
FAURE	Anne-Karen	Biologie de la procréation / CECOS Département génétique et procréation Pôle 9: Couple/enfant
FAURE	Julien	Département génétique et procréation Pôle 9: Couple/enfant
GARBAN	Frédéric	Unité clinique thérapie cellulaire Pôle 5 : Cancerologie
GAVAZZI	Gaëtan	Clinique médecine interne gériatrique Pôle 8 : Pôle pluridisciplinaire de Médecine
GRAND	Sylvie	Clinique de Radiologie et Imagerie Médicale Pôle 13 : Imagerie
HENNEBICQ	Sylviane	Biologie de la procréation / CECOS Département génétique et procréation Pôle 9: Couple/enfant
HOFFMANN	Pascale	Clinique Universitaire Gynécologie Obstétrique Pôle 9: Couple/enfant
JACQUOT	Claude	Clinique d'Anesthésie Pôle 2 : Anesthésie - Réanimations
LABARERE	José	Département de veille sanitaire Pôle 17 : Santé Publique

LAPORTE	François	Département de biologie intégrée Pôle 14: Biologie
LARDY	Bernard	Département de biologie et pathologie de la cellule - Laboratoire d'Enzymologie Pôle 14: Biologie
LARRAT	Sylvie	Département des agents infectieux Pôle 14: Biologie
LAUNOIS-ROLLINAT	Sandrine	Clinique de Physiologie sommeil et exercice Lab. explor. fonct. cardio-respiratoires Pôle 12 : Rééducation et physiologie
MALLARET	Marie-Reine	Unité d'Hygiène Hospitalière Pavillon E
MOREAU-GAUDRY	Alexandre	Département d'innovations technologiques Pôle 17 Santé Publique
MOUCHET	Patrick	Clinique de Physiologie sommeil et exercice Lab. explor. fonct. cardio-respiratoires Pôle 12 : Rééducation et physiologie
PACLET	Marie-Hélène	Département de biologie et pathologie de la cellule - Laboratoire d'Enzymologie Pôle 14: Biologie
PALOMBI	Olivier	Clinique de neurochirurgie Pôle 3 : Tête et cou et chirurgie réparatrice
PASQUIER	Dominique	Département d'anatomie et cytologie pathologiques. Pôle 14 : Biologie
PELLETIER	Laurent	Centre d'innovation biologique
PAYSANT	François	Clinique de Médecine Légale Pôle 8: Pôle Pluridisciplinaire de Médecine
RAY	Pierre	Biologie de la reproduction Département génétique et procréation Pôle 9: Couple/enfant
RENVERSEZ	J.Charles	Département de biologie intégrée Biochimie et Biologie Moléculaire Pôle 14 : Biologie
RIALLE	Vincent	Laboratoire TIMC LA TRONCHE
SATRE	Véronique	Génétique chromosomique Département génétique et procréation Pôle 9: Couple/enfant
STANKE-LABESQUE	Françoise	Laboratoire de Pharmacologie
STASIA	Marie-Josée	Département de biologie et pathologie de la cellule Pôle 14: Biologie
TAMISIER	Renaud	Clinique de Physiologie sommeil et exercice Lab. explor. fonct. cardio-respiratoires Pôle 12 : Rééducation et physiologie
WEIL	Georges	Biostatistiques et Informatique Médicale Pôle 17 Santé Publique

Remerciements

Au Dr Tapissier : pour m'avoir donné envie de faire de l'ophtalmologie.

A mes maîtres :

A M. le Professeur Romanet : pour l'accueil au sein de votre service, pour l'enseignement de vos connaissances théoriques et pratiques et la transmission de votre passion pour l'ophtalmologie.

A M. le Professeur Chiquet : pour m'avoir confié ce travail, pour votre engouement à la réalisation de cette étude et votre rigueur médicochirurgicale.

A M. le Professeur Thuret : pour votre présence le jour fatidique.

Au Dr Frédéric Rouberol : pour la découverte de la chirurgie vitréorétinienne et ta participation à cette étude.

Au Dr Karine Palombi : pour une ambiance au bloc garantie... avec Christie!

Au Dr Pierre Pégourié et Dominique Satger : pour m'avoir donné envie de faire de l'échographie et votre accueil chaleureux au sein du CTEREO.

Aux Dr Viviane Vinh, Dr Ruxandra Hera, Dr Jean Yves Millet et Dr Brigitte Gonzalves : tout paraît si simple en rétine médicale à vos côtés.

Au Dr Moyenin : pour les premiers pas en ophtalmologie.

Au Dr Olivier Savy et Dr Chibani: pour l'ascension chirurgicale .

A Sabine : vivement l'hiver prochain pour l'initiation au skating!

Aux assistants, Matthieu et Elisabeth : que ça waxe toujours pour vous!

Aux autres spécialités :

Aux neuroradiologues : Emilie et Marie : pour notre trio de drôles de dames ; Fabrice Bing: pour tout ce que tu m'as appris ; Dr Vasdev et Dr Boubagra : pour les séances enrichissantes en neuro-interventionnel ; Pierre Bessou : pour les heures passées en IRM à refaire le monde.

Aux ORL : Alekos : pour ce semestre inoubliable en tant que co-interne ; Nils Morel : pour ton assurance ; Cédric Porret et Edouard Soriano : des assistants de choc ; Pr Reyt : pour mes débuts d'internat.

Aux anesthésistes : Ana, Marie Pierre, Blandine, Edith... sans oublier Jules : les meilleurs marchands de sable.

Aux équipes hospitalières:

Aux infirmières : pour votre présence et votre aide (Martoche, Catherine, Françoise, Jocelyne, Marie No, Chantal, Véro... à Grenoble ; Estelle, Isa, Nath, Chantal... à Chambéry), aides soignants et brancardiers.

Aux équipes des blocs opératoires : pour l'ambiance et le professionnalisme (Marie, Karine, Marie Anne, Françoise... à Grenoble ; Christelle, Françoise, Christine, Anne... à Chambéry).

Aux secrétaires : pour votre disponibilité et patience (Cath, Bambou, Nath, Brigitte, Myriam... et Bernadouche, Flore, Faustine...).

Aux orthoptistes : Laetitia, Armelle, Flo...

Aux manip radio : pour les bons moments passés devant les consoles (Nagette, Cédric, Yann, Catherine...).

A mes co-internes :

A Diane : la meilleure coach et à nos nombreuses rigolades.

A Tiffon : pour le superbe séjour à Miami et les bons repas au Touvet.

A Auré : pour le semestre inoubliable à Chambéry.

A Youyou : pour ta spontanéité et notre parcours en vélo de St Egrève au CHU.

A Eva : pour ta détermination depuis le début de notre internat.

A Ralitsa : une femme de poigne au grand cœur.

A Benj : pour ta gentillesse et ta disponibilité.

A Hafid, Ahmed, Thierry, Joséphine, Antoine... : une belle brochette d'internes!

A ma famille :

A Yann : la vie est si belle à tes côtés, merci pour ton soutien, ta patience et ta règle d'or : PPP!

A Kitty : dans mon ventre et déjà très dynamique!

A Mum and Dad: c'est grâce à vous que je suis devenue ce que je suis, merci pour tout ce que vous m'avez apporté.

A Clém : je suis fière de toi, bonne route avec Julie.

A Mamy Raymonde : j'aurais aimé que tu sois là, tu resteras toujours à mes côtés.

A Papy Louis : j'aimerais avoir ta santé de fer, à notre complicité.

A Papy Pierre et Mamy Hélène : aux bons moments passés au Grand-Lemps et au Barthelon.

Aux oncles, tantes, cousins et cousines : aux bonnes fêtes de famille passées et à venir.

A Michou, Pascal, Lolo, Marjo et Gégé : pour l'accueil chaleureux au sein de votre famille.

A Nicole Renot : pour tes clins d'œil à chaque voyage et tes bons repas.

A mes amis

A Anne, ma jumelle de Temae : je te considère comme ma sœur.

A Claire : une amie fidèle, merci pour ton soutien.

A Elisabeth : la reine de l'acu et de la salsa.

A Charlotte : aux souvenirs de la salle de 10 m² et aux prochains barbecues à Bessenay.

A Reb : tu n'as pas changé depuis les années collège, toujours contente de te retrouver.

Aux membres de l'ACT : Phi, Ghisl, Denis, Guillaume... : que de bons souvenirs et vivement les prochains fous rires.

Aux copains de lycée : JB, Zaz, Jean Lo, Denis, Tobs, Dave... : encore plein d'anniversaires à fêter ensemble.

A Carole, Yann, Stéphanie, Géraldine, Anne, Sylvain, Patrick...

Yours sincerely,

Christophe CHIQUET

CENTRE HOSPITALIER UNIVERSITAIRE

B.P. 217 - 42043 Grenoble Cedex 09 France

www.chu-grenoble.fr - N° SIRET : 362 300 392 000 14

POUR PLUS D'INFORMATIONS, VISITEZ LE SITE INTERNET



**SERVICE
D'OPHTALMOLOGIE**

Grenoble, 24/06/2010

Pr J.P. Romanet
Chef de Service
Fax : 0476767570

Pr C. Chiquet
☎ 0476765271
Fax : 0476765757
cchiquet@chu-grenoble.fr

Dr R. Hera
Dr B. Gonzalvez
Dr K. Maurent-Palombi
Praticiens Hospitaliers

Dr V. Vinh-Moreau-Gaudry
Dr M. Tonini
Dr E. Renard
Chefs de Clinique - Assistants

Hôpital de Jour
☎ 0476768753
fax 0476765140

Hospitalisation
☎ 0476768875
fax 0476768821

Consultation
☎ 0476765814/8952
fax 0476765282

Urgences
☎ 0476765566

Hôpital MICHALLON
8ème étage

Dear Editor,

Please find enclosed a full-length paper entitled "**Comparative study of 23-gauge vitrectomy versus 20-gauge vitrectomy for the treatment of rhegmatogenous retinal detachment**" that we wish to submit to RETINA.

All authors have seen and approved the manuscript and have contributed significantly to the work. The manuscript has not been published and is not being considered for publication elsewhere. I have obtained written permission from all persons named in the acknowledgments.

This comparative nested case-control study gives new insights into the efficacy and safety of 23-G transconjunctival sutureless vitrectomy for the management of rhegmatogenous retinal detachment without severe PVR.

Given a large cohort of 1150 patients enrolled in a prospective study, we were able to match 35 new consecutive eyes operated on using 23-G TSV with 35 eyes operated on using conventional 20-G PPV. Using **matched populations** reduces the effect of selection bias and guarantees the absence of confounding factors, such as detachment of the macula, high myopia, PVR, number and extent of retinal tears, preoperative visual acuity, and duration of visual acuity loss.

This original study provides new data on the usefulness of 23-G TSV in RD surgery and showed that, especially in pseudophakic eyes, both techniques are not significantly different in terms of the single reattachment rate (77%) and the visual results. These visual and anatomical results are similar and did not confirm the superiority of one technique over the other for the repair of nonsevere rhegmatogenous RD. The 23-G TSV technique allows the surgeon to reach the same objectives as the 20-G technique, but with its own limitations and potential complications. The data and conclusion of this study should interest a large number of readers of *RETINA*.

Yours sincerely,

Christophe CHIQUET, MD, PhD

CENTRE HOSPITALIER UNIVERSITAIRE DE GRENOBLE

B.P. 217 - 38043 Grenoble Cedex 09 standard 04 76 76 75 75
www.chu-grenoble.fr - N° SIRET : 263.800 302 000 14 - N° FINISS : 38.07800.80

POUR TOUTE CORRESPONDANCE, VEUILLEZ RAPPELER LE NOM DU SERVICE ET LE DESTINATAIRE, MERCI...

Comparative study of 23-gauge vitrectomy versus 20-gauge vitrectomy for the treatment of rhegmatogenous retinal detachment

Albrieux Magali,¹ MD, Rouberol Frédéric,^{2,3} MD, Bernheim Diane,¹ MD, Romanet Jean-Paul,¹ MD, Chiquet Christophe, MD, PhD¹

- 1 Department of Ophthalmology, University Hospital of Grenoble, Joseph Fourier University, Grenoble, France
- 2 Department of Ophthalmology, University Hospital of Lyon, Hospices Civils de Lyon, Claude Bernard Lyon 1 University, Lyon, France
- 3 Kleber Center of Ophthalmology, Lyon, France

Key words: 23-gauge vitrectomy, pars plana vitrectomy, retinal detachment, pseudophakic, transconjunctival sutureless vitrectomy

Corresponding author:

Christophe CHIQUET, MD, PhD

Clinique Universitaire d'Ophthalmologie, Centre Hospitalo-universitaire de Grenoble, BP217, 38043 Grenoble cedex 09, FRANCE. cchiquet@chu-grenoble.fr

Abstract:

Objective: To compare the safety and efficacy of 20- and 23-gauge pars plana vitrectomy (PPV) for the management of primary rhegmatogenous retinal detachment (RD) with proliferation vitreoretinopathy (PVR) grade B or less.

Methods: This comparative nested case-control study included 35 consecutive 23-gauge transconjunctival PPV cases matched with 35 cases of 20-gauge PPV (from a prospective cohort of 1150 patients) for the baseline visual acuity (VA), axial length, lens and macular status, the location and number of breaks, and PVR grade. All patients had complete PPV, cryotherapy, fluid–gas exchange, and a minimum follow-up of 6 months. The exclusion criteria were eyes with previous vitreoretinal surgery, combined vitrectomy and cataract surgery, RD secondary to trauma or macular hole, diabetic retinopathy, aphakic eyes, giant tears, or posteriorly located breaks precluding treatment using transconjunctival cryotherapy.

Results: Baseline examination disclosed pseudophakia in 77.1%, 2.7 ± 2.2 retinal breaks / eye, attached macula in 37.1%, and PVR grade B in 24.3% of the cases. The mean operative time and intraoperative complication rate (11.4%) were similar in both groups. The single reattachment rate and the final anatomical success rate were similar in both groups, 77% and 97%, respectively. Mean preoperative VA of 1.2 ± 0.9 logMAR improved similarly in both groups to 0.4 ± 0.4 at the 6-month visit. A final vision of 20/40 or better was achieved in 61.4% of the eyes.

Conclusion: Twenty-three-gauge PPV provides anatomical and visual results similar to the 20-G technique for the management of uncomplicated rhegmatogenous RD.

Introduction

Primary pars plana vitrectomy (PPV) has gained popularity in the last 15 years in the treatment of retinal detachment (RD), especially in pseudophakic eyes, with¹⁻⁴ or without³⁻¹¹ scleral buckling. A 23-gauge (23-G) sutureless transconjunctival system was initially reported by Hilton in 1995 (ARVO meeting, known as the Visitrec Vitrectomy Unit)¹² with a two-sclerotomy technique and then developed by Eckardt in 2005¹³ with a three-way PPV technique. More recently, several authors have reported successful anatomic and visual outcomes with transconjunctival sutureless vitrectomy (TSV) in eyes with different vitreoretinal disorders, such as epiretinal membranes,^{14, 15, 16-23} macular holes,^{15, 17-23} vitreous hemorrhage,^{15, 19, 20, 23-25} and proliferative diabetic retinopathy.^{15, 20, 21, 23, 25, 26} This technique gained favor with many vitreoretinal surgeons since complication rates are considered comparable to those reported with 20-gauge (20-G) systems,^{13, 15, 21} with less induced corneal astigmatism^{16, 25, 27} and reduced patient discomfort²² but conflicting results concerning less surgically induced inflammation.^{16, 28} All these studies suggest that 23-G instrumentation is safe and effective for performing vitreoretinal surgery.

The efficacy of 23-G TSV PPV for RD surgery was suggested in recent retrospective studies^{18, 19, 21, 23, 26, 29, 30} and in two prospective studies.^{31, 32} Most of the time, the description of patients with RD is reported in a large series of patients operated on for indications other than RD, which precludes any comparisons between studies.^{21, 30} This prompted us to design a comparative nested case-control study comparing the efficacy and side effects of 23-G PPV versus 20-G PPV associated with cryotherapy and gas tamponade for the surgery of primary rhegmatogenous RD.

Methods

This nested case-control study included 70 patients (70 eyes) with primary rhegmatogenous RD who underwent 23-G TSV ($n=35$) or 20-G PPV ($n=35$), associated with cryotherapy and gas tamponade. This study followed the Declaration of Helsinki guidelines for research involving human subjects and was approved by the local Institutional Review Board (#5891). All patients enrolled in this study provided signed informed consent before the intervention.

Selection of the population

Inclusion criteria for both groups (23- and 20-gauge PPV) were patients older than 18 years who were newly referred for primary rhegmatogenous RD. Exclusion criteria were eyes with previous vitreoretinal surgery, combined vitrectomy and cataract surgery, RD secondary to trauma or macular hole, diabetic retinopathy, aphakic eyes, preoperative proliferative vitreoretinopathy (PVR) grade C, giant tears or posteriorly located breaks precluding treatment using transconjunctival cryotherapy, and dense vitreous hemorrhage precluding the assessment of retinal breaks and RD preoperatively. One eye per patient could be included in the study. All patients included in this study benefited from the technique associating complete PPV, cryotherapy of tears, and fluid–gas exchange.

A cohort of 1150 consecutive patients with previously untreated rhegmatogenous RD (IRB #5891) and operated on by two surgeons (FR and CC) was prospectively studied between 2004 and 2008, with a minimum follow-up of 6 months, using a standard data sheet at baseline on the 1st day and 1 and 6 months after surgery for all patients. Between April 2007 and December 2008, 35 consecutive patients meeting the inclusion and exclusion criteria described above were operated using the 23-G technique. The group of 20-G patients was selected from the prospective cohort of 1150 patients in order to select 35

patients matched to the 23-G group, blinded to the follow-up data, for all the following criteria: preoperative best corrected visual acuity, high myopia (axial length >26 mm), lens and macular status, the location and number of breaks in attached or detached retina, PVR grade, and duration of visual acuity loss.

Clinical data

Each patient underwent a detailed preoperative evaluation (tables 1-2) including estimation of symptom duration (floaters, photopsia, visual field loss), best corrected visual acuity (VA), intraocular pressure (IOP) measured by Goldmann applanation tonometry, as well as cornea and lens status. VA was converted to a logarithm of the minimum angle of resolution (logMAR) score for analysis³³. Pre- and postoperative fundus examination was performed using both the three-mirror (Goldmann) lens and indirect ophthalmoscopy. Axial length measurements were obtained from ultrasound imaging (Cinescan™, Quantel Medical). The following patient information was also collected: age, gender, systemic disease, previous ocular surgery, and associated eye diseases.

Retinal detachments were characterized in terms of extent (degrees), location, macular involvement, number and location of retinal breaks, and PVR. The inferior location of a break was defined by the presence of this break strictly below the 3 o'clock or 9 o'clock meridian. The PVR grade was determined according to the Retina Society classification.³⁴

Surgical technique

All patients were operated on under general anesthesia. The Accurus vitrector (Alcon™ Laboratories, Rueil-Malmaison, France) was used for all surgical procedures with a comparable cutting rate of 1500/min and a suction rate ranging between 120 and 400 ml/min. A contact wide-angle viewing system combined with an image inverter (SDI Oculus

Ile, Wetzlar, Germany) and a plane-concave lens (FCI™, ref. S5.7010, Paris, France) were used for fundus visualization. All eyes underwent complete PPV with induction of the posterior vitreous detachment (PVD) if necessary, peripheral vitreous dissection under scleral depression, cryotherapy of retinal breaks (ErboKryo AE, Erbe™, Limonest, France), either transconjunctively for the 23-G group or transsclerally for the 20-G group, then a fluid/gas exchange using 20% sulfur hexafluoride (SF6) or 16% hexafluoroethane (C2F6) with ab interno drainage in most cases (table 3). Perfluorocarbon liquid (PFCL, FCI™, ref. S5.8150, Paris, France) was used, if needed, in selected cases of bullous peripheral RD to flatten the posterior retina and help peripheral vitrectomy. Cryotherapy was limited to areas of retinal breaks, suspected zones, or predisposing lesions. No combined phacoemulsification with vitrectomy was used. Scleral buckling was not performed in any case. Laser photocoagulation was not used. Vitreous shaving was performed with scleral indentation.

The two-step 23-gauge Dutch Ophthalmic Research Center system (DORC™, Zuidland, Holland) was used: a disposable Eckardt vitrectomy trocar system (ref. 1272.ED06), a disposable pneumatic vitrectome (ref. 2267.NMD06), and a disposable triple-port fiber (ref. 3269.D06). The technique of displacement of the conjunctiva and tunnelization was similar to that previously reported.¹³ At the end of surgery, the microcannulas were withdrawn and gentle pressure was applied on the sclerotomy with a cotton tip applicator. Vitrectomy was applied on the scleral surface in order to relieve the vitreous at the external site of each sclerotomy. Then 10% povidone-iodine solution was applied on the ocular surface for 3 min followed by a rinse with BSS. Antibiotic and steroid (dexamethasone) ointment was applied on the eye before patching.

With the 20-G system, the sclerotomies and conjunctiva were closed with Vicryl 8.0 sutures. A steroid (dexamethasone) was injected subconjunctively at the end of surgery before patching.

Postoperative follow-up

All patients maintained postoperative head positioning defined by the tear location for a duration ranging from 8 to 14 days, depending on the type of gas used, SF₆ or C₂F₆, respectively. All patients in both groups systematically had a short course of oral acetazolamide (250 mg 3×/day) for 48 h.

Postoperatively, a complete ocular examination was performed on the 1st day and at 1 and 6 months. The clinical data recorded included best corrected VA (at 1 and 6 months), presence of conjunctival leaks, anterior chamber examination (depth, inflammation), IOP, and fundus examination. The definition of hypotony was IOP 5 mmHg or less.^{30, 35} Cataract development was defined as an increased LOCS III of 2.⁴

The outcome measures studied were the primary reattachment rate (complete reattachment of the retina at the 6-month visit, major clinical endpoint), the final anatomical success rate, the postoperative VA, and intra- and postoperative complications (table 4). All patients were assessed for a minimum follow-up of 6 months. Table 5 reports the results of all patients, including those who had surgery for cataract ($n=7$), silicone oil removal ($n=2$) or additional RD surgery ($n=16$), with final examination considered 3–6 months after the second procedure.

Statistical analysis

The nested case-control study design^{36, 37} was used to compare the group of patients operated on with 20-G and the group operated on with 23-G PPV. The primary outcome measure of the study was the postoperative single-operation success rate. The secondary outcome measures were postoperative visual acuity (LogMAR units) and the complication rate. Quantitative data were expressed as mean \pm standard deviation (SD). The two surgery

groups were compared using the paired *t*-test for quantitative data and chi-square analysis (McNemar test) for qualitative data. Based on an alpha risk of 0.05, a beta risk of 0.2, a 20% difference in success rate between the two groups (90% in the 20-G and 70% in the 23-G group), the calculated sample size (number of pairs of patients) was 35.³⁸ The statistical analysis was performed using the Statistical Package for the Social Sciences program (SPSS 17.0 for Windows, Chicago, IL, USA). Statistical significance was defined as a two-tailed *P*-value of less than 0.05.

Results

Baseline characteristics (Tables 1 and 2)

The preoperative demographics of the 70 patients are summarized in Table 1. No significant differences between the two groups were observed for baseline epidemiological, ocular, and RD characteristics. Forty-two percent of patients were women and the mean patient age was 62.4 ± 16.1 years. Severe myopia was present in 22.6% of the eyes. Most patients were pseudophakic (77%). The time between cataract surgery and retinal detachment was 53.6 ± 42.5 months; the time between capsulotomy and retinal detachment was 42.7 ± 44.9 months. Phakic patients had no cataract at the time of RD diagnosis.

The characteristics of RD are listed in Table 2. As expected, both groups were similar for the main prognostic factors such as initial VA, macular detachment, number and location of retinal breaks, and PVR. Most RDs were related to superior retinal breaks and PVR was grade A in 27.1% and grade B in 24.3%.

Surgery (Table 3)

The surgical technique with cryotherapy, ab interno drainage, and complete vitrectomy was similar in both groups. As stated in Table 3, the type of gas tamponade was significantly different, with most cases treated with SF₆ in the 23-G group and C₂F₆ in the 20-G group. The total duration of surgery (70.6 ± 21.9 min) showed no significant difference between the two groups.

Anatomical outcomes (Tables 4 and 5)

All 70 patients had a minimum postoperative follow-up of 6 months (range, 6–23; mean, 8.5 ± 4.1) and the total follow-up was similar in both groups ($p=0.2$). The single-

operation success rate (complete primary reattachment of the retina) was achieved in 77.1% of the eyes, similar in the two groups. Subsequent redetachment occurred in 22.9% and the majority of patients were cured with a second surgery (using a 20-G system). Redetachments were mainly observed during the 1st postoperative month (range, 0.5–2.1 months; mean, 1.3 ± 0.4) and the rate did not differ depending on the group ($p=0.99$). The most common cause of redetachment stemmed from previously unseen breaks and/or the development of new retinal breaks (57% in the 23-G group and 44% in the 20-G group) and/or PVR (43% in the 23-G group and 22% in the 20-G group). The association of new retinal breaks and PVR was seen in 22% of the 20-G group. There was only one case with no visible tear during the first surgery with 20-G PPV. Finally, the retina was reattached (after silicone oil removal) in 97.1% of the cases.

In the 23-G group, the reoperation technique included a 20-G PPV ($n=6$), cryotherapy ($n=6$), gas ($n=5$) or silicone tamponade ($n=1$), and scleral indentation ($n=5$). One patient had scleral buckling surgery. Five eyes achieved a reattached retina with a second surgery and one eye with a third surgery. One patient still had a detached retina at the final examination after two surgeries and refused the third surgery.

In the 20-G group, reoperation included 20-G PPV ($n=6$), cryotherapy ($n=6$), gas ($n=8$) or silicone tamponade ($n=1$), with scleral indentation in all cases. Three patients had a scleral buckling surgery. All eyes achieved retinal reattachment with a second surgery except one eye. This patient refused a third surgery.

At the 6-month visit, the fundus examination reported macular abnormalities in 17.6% of the cases, mainly epiretinal membranes (10.3%) and macular hole (4.4%). The patients with macular holes in both groups refused a secondary surgery.

Visual functional outcomes (Tables 4 and 5):

For all eyes enrolled in the study, the mean VA improved from 1.2 ± 0.9 to 0.4 ± 0.5 ($p < 0.001$). The gain in logMAR was higher in patients with macula OFF RD (1.38 ± 0.9) vs macula ON (0.3 ± 0.7 , $p = 0.001$). There was no significant difference between the VA at 6 months and at the final examination. The visual gain was not significantly associated with the extent of RD, severity of myopia, occurrence of intraoperative complications or the operation time.

Complications:

Intraoperative complications:

The rate of intraoperative complications (11.4%, Table 3) was similar in both groups. In the 23-G group, we noted three cases of iatrogenic retinal tears (including one case of sclerotomy-site-related retinal tear) and one case of choroidal detachment secondary to a dislodgment of the infusion line. Two cases of subconjunctival hemorrhage at the trocar site were not considered a complication per se. Technical problems were encountered but were not complicated, with dislodgement of the 23-G cannulas in two cases and temporary blockade of instruments in the trocar system in one case. Suturing the sclerotomy sites was required in two eyes (5.7%, on two sites in one eye and on the infusion site in the other eye) because at the end of the surgery, conjunctival sutures were required in 51% of the eyes (or 21% of the sclerotomies sites) in order to reduce the potential risk of scleral exposure at the entry site in cases of conjunctival laceration. Other complications such as lens or posterior capsule touch and conversion to the 20-G system were not encountered.

In the 20-G group, there were two cases of iatrogenic retinal breaks with one giant tear due to retinal incarceration and one sclerotomy site related to retinal tear, as well as one case of choroidal detachment at the infusion site.

Early postoperative complications:

The mean IOP at day 1 was similar in the two groups. No case of hypotony was diagnosed after surgery. One patient operated on using 23-G TSV had IOP of 8 mmHg on day 1 with no choroidal detachment and returned to normal IOP values (10 mmHg) on day 2. In the 20-G group, eight patients had IOP higher than 21 mmHg (range, 24–40 mmHg) versus six patients in the 23-G group (range, 23–40 mmHg). In all patients, intraocular hypertension was then controlled by topical and systemic hypotensive treatment.

Chemosis was noted in eight eyes in the 23-G group, with no leak. Choroidal detachment, loss of gas under the conjunctiva, or insufficient filling of the vitreous cavity (gas volume < 50%), and acute endophthalmitis were not observed in any eyes in either group.

Discussion

This comparative prospective study of 23-G and 20-G PPV for RD repair showed similar anatomical and visual outcomes and showed that 23-G TSV is a safe and reproducible technique for the management of noncomplex RD.

The validation of a new technique, here 23-G TSV, in a selected indication should first refer to the capacity of obtaining at least the same rate of functional and anatomical results and an acceptable rate of adverse events when compared to the standardized technique (i.e., 20-G PPV). Only a prospective comparative study can answer these questions, ideally with a randomized clinical trial. As demonstrated by previous reports,¹⁻⁴ the comparison of a technique in RD is difficult due to the variability of the initial presentation and the several clinical factors that have an effect on the anatomical and visual prognosis. Based on hypothesized differences on anatomical or functional criteria, these clinical trials included between 75 and 200 patients per group (calculated sample size, 75 patients/group based on the reattachment rate,^{6, 10} calculated sample size of 200 patients/group based on the difference in VA change).³⁹ In this field with wide variation in the clinical characteristics of RD, treatment can also be evaluated by designing a prospective study with matched cases,⁴⁰ reducing the effect of selection bias and adjusting for several variables at once, limiting the impact of confounding factors. Therefore, we selected a matching procedure based on the major clinical factors being predictive of anatomical or functional prognosis.

The anatomical success rate noted in this study is comparable to those of recent prospective studies using 20-G PPV alone (without scleral buckling) in pseudophakic (single-operation anatomic success rate between 62% and 100%^{3-5, 7-11, 41, 42} or phakic patients (64–80%).^{4, 5} As suggested by a recent retrospective comparative study (25-G vs 20-G),⁴³ our results show that 23-G TSV with retinopexy and gas tamponade is also an effective

technique in eyes without severe PVR, providing a single-operation anatomic success rate of 77%. Especially in pseudophakic eyes, predominant in this series, PPV has been shown to offer advantages over SB surgery, including lower operating time,⁴¹ accurate diagnosis of retinal breaks, sometimes after performing a posterior capsulotomy or removing vitreous hemorrhage,^{4, 7, 41} a higher reattachment rate with a single surgery^{4, 11, 41}, and no postoperative axial length changes.^{11,41}

TSV for RD repair was reported in retrospective studies using 25-G ($n=13-64$ patients)⁴³⁻⁴⁷ or 23-G TSV ($n=5-27$)^{18, 19, 21, 23, 26, 29, 30} and in noncomparative prospective studies using 25-G ($n=15$)⁴⁸ or 23-G TSV ($n=20-24$).^{31, 32} However, most retrospective studies did not report detailed data (characteristics of RD, surgical procedures, and results) concerning patients with RD. Our study differed significantly from of the study reported by Tsang et al.³¹ in the number of patients ($n=35$ vs 24), the comparison with a 20-G matched group (in our study), the characteristics of the eyes included (pseudophakic 77% vs 20.8%, inferior tears in 10% vs 29%), the surgical technique (use of cryotherapy in all cases vs cryotherapy \pm laser in 15/24 cases, no combined surgery vs combined phacoemulsification in 79% of phakic patients, SF6 and C2F6 vs SF6 and C3F8), and the follow-up time (6 vs 3 months). Both studies were comparable for the concept of the surgery associating PPV/retinopexy/gas and the frequency of macula ON RD (37%) and the PVR grade (<C). These differences preclude comparison with this study, which reported a slightly higher rate of 91.7%³¹.

Similar visual results after 23-G TSV and 20-G PPV for RD, -2.5 and -2.6 logMAR, respectively, compared favorably with other series of 20-G PPV in pseudophakic eyes (from -0.65 in pseudophakic and aphakic eyes to -0.56 in phakic eyes at 1 year follow-up⁴ and -0.82 in pseudophakic eyes at 6-12 months follow-up³). Approximately 50% of patients in

both groups achieved a visual acuity of 20/40 or better at the 6-month evaluation, which suggests that 23-G TSV has the same visual prognosis as 20-G PPV. Comparisons with other prospective studies using 20-G PPV in pseudophakic eyes are difficult since the populations studied are not always comparable (11.3% with final VA \geq 20/40 at 6 months,¹⁰ 72% at 1 year,⁴¹ and 39.7% at the final visit at 8.8 months¹). A visual and anatomical evaluation was made in patients who had undergone a secondary procedure (cataract or vitreoretinal surgery for ERM or RD redetachment). Our final results showed a slightly better visual result (60% with final VA \geq 20/40) than at 6 months, possibly because two patients evaluated at 6 months in the 23-G group were reoperated for RD, with a final reattached retina rate of 97.1%, and because eight patients (three in the 20-G group, five in the 23-G group) underwent cataract surgery after the 6-month evaluation. The rate of postoperative macular ERM or MH and cataract was also similar in the two treatment groups.

There are several potential advantages of 23-G TSV over conventional 20-G PPV, including absence of suture-related irritation or a local inflammatory reaction at the sclerectomy sites, limbal stem cell damage due to conjunctival dissection, absence of significant corneal and astigmatic changes in the early postoperative period, and increased patient comfort. In addition, the potential advantages of 20-G PPV without scleral buckling over conventional scleral buckling surgery are also expected to be the advantages of 23-G TSV. As reported earlier in macular, vitreous^{22, 24}, and RD surgery,²⁰ the surgical operating time was similar in both groups. The most important factor is the time of vitrectomy per se, as stated above. Since our study was not randomized and not designed to check this point, we cannot compare the duration of each step of RD surgery. Most studies reporting shorter surgery duration are retrospective²⁰ and included limited PPV, especially in macular surgery.

No switch to the 20-G system was necessary in this consecutive series. The 23-G surgery was not limited by the conventional halogen light source. However, in selected

indications, the use of a xenon light source with or without a transconjunctival twilight chandelier³¹ could increase visualization of the peripheral retina, especially in patients with poor pupil dilation or peripheral capsular fibrosis. Finally, we had no problems grasping the posterior hyaloids at the time of PVD induction. We found that the 23-G technique was similar to the 20-G technique, although scleral indentation was more delicate, especially on the nasal side (explaining conjunctival laceration in some cases). Intraocular manipulations were performed with equal facility.

Complications were rare and compared favorably with the 20-G group and previously reported 20-G series. RD surgery is associated with movements of the eye, scleral indentation, and moving instruments in awkward and extreme directions. The surgeon should be aware of the displacement of trocars close to the lens or the peripheral retina. No such complications were encountered in this series. In one patient, we encountered the inadvertent displacement of the infusion cannula complicated by a temporal choroidal detachment, but the surgery could be continued. At the end, choroidal fluid was passively drained via the scleral tunnel of the 2 o'clock sclerotomy. This complication was not noted previously in a personal series of 70 previous surgeries with 23-G TSV PPV but was reported to have an incidence of 1.8% in a recent paper.⁴⁹ Choroidal detachment and hemorrhage were noted in one randomized study in 23-G TSV.²²

The self-sealing nature of the incisions in TSV surgery poses theoretical concerns of a possible increased risk of hypotony, vitreous incarceration, and postoperative endophthalmitis. In contrast to what has been described in the literature,^{20, 23, 30} we did not observe frequent hypotony or postoperative choroidal detachment in the 23-G group, fluid leak, or gas sealing at the end of the surgery or during the first postoperative days. We defined hypotony as when IOP was 5 mmHg or less (clinically significant hypotony),^{30 35} somewhat different from other reports (< 6 mmHg,^{23, 50} < 8 mmHg,²¹ < 9 mmHg^{17, 31}, and <

10 mmHg^{18, 20}). We finally reported no cases with IOP 5 mmHg or less and 2.8% of the cases with 10 mmHg or less, as recently reported in another prospective study on RD (4%).³¹ This low frequency probably results from the scleral incision technique, with only two cases requiring scleral sutures. This rate ranged from 0 to 14% in most studies^{18, 20-23, 30, 51} and up to 38% in one study.¹⁹ A number of factors may explain the variable rate of scleral suture such as the type of bevel, the tunnelization technique (one or two steps),¹⁹ the scleral properties of the eyes, the amount of vitrectomy (history or prior vitrectomy, vitreous base dissection),^{19, 30} use of gas tamponade¹⁹ and the surgeon's experience. To limit the effect of a possible learning curve in our study, approximately 70 vitrectomies using the same 23-G TSV system were performed before the beginning of the study. In all cases, peripheral vitreous shaving was performed, leaving a limited amount of peripheral vitreous skirt close to the sclerotomies. This suggests that vitreous incarceration was minimal and probably not responsible for the wound closing. In 25-G surgery, the disruption of the internal aspect of oblique wounds is more pronounced after the surgeon has passed the instruments through the cannula.⁵² This last point needs to be confirmed in 23-G surgery, especially in surgery with multiple intraocular manipulations that can change the wound architecture from its original construction. Two potentially protective factors were identified in our series: the presence of a large bubble of gas in the first postoperative days⁵³ and the suture of two sclerotomies at the end of the surgery, when necessary.

For similar reasons, sutureless sclerotomies may allow for persistent fluid egress across the wound and potential influx of bacterial pathogens into the vitreous cavity. In this series, the conjunctiva was sutured in 51% of the eyes because of fragile conjunctiva, favored by eye manipulations during scleral indentation and cryotherapy, especially in eyes with a shortened fornix and a narrow palpebral fissure. As stated above, using beveled 23-G incisions with adequate wound apposition,^{53, 54} examining and removing vitreous wicks from

sclerotomies, and closely checking for a water-tight sclerotomy are all important factors in the prevention of postoperative endophthalmitis.

The strengths of this study are its prospective design with a minimum follow-up of 6 months, and the same retinopexy and tamponade techniques. The follow-up period was sufficient to evaluate surgically related complications in the immediate postoperative period. Since most patients were pseudophakic (77%), the potential role of cataract formation on postoperative visual acuity was reduced. At the 6-month evaluation (the study's primary endpoint), the same proportion of eyes with cataract and eyes that underwent cataract surgery was noted in both groups (see Table 4). Therefore, the visual results at the 6-month visit are not likely to be dependent on cataract formation. The nested case-control design is being increasingly used in cohorts of patients from prospective studies and allows for statistically efficient analysis of data from a cohort with substantial savings in cost and time, with relatively minor loss in statistical efficiency.^{36, 37} In our study, the matched populations in the two groups also limited the potential bias associated with preoperative confounding factors playing a role on visual outcome, such as detachment of the macula, high myopia, preoperative visual acuity, and duration of visual acuity loss.

The interpretation of our study is partly limited by the nonrandomized nature of the study, and the selective use of cryotherapy. Endolaser photocoagulation is the other effective means used to induce chorioretinal adhesion.³¹ The only intraoperative difference noted between the 20-G and 23-G groups was the gas used for tamponade, with C2F6 used more frequently in the 20-G group. SF6 was preferentially used in the 23-G patients since those operated with 23-G TSV were managed in the center near the mountains, where SF6 was the preferred gas used. This difference in gas tamponade could be a factor enhancing intraocular hypertension and increases the time of retinal tear tamponade after surgery. This

bias could potentially favor the 20-G group in terms of anatomical success, but this was not demonstrated in this study. Other factors were not studied in this series, such as quality of life including patient comfort, which requires a randomized design.²² A recent noncomparative study reported a less than 20% rate of patients with moderate sensation of foreign body or pain.³¹

Conclusion

This prospective comparative study of Retinal Detachment surgery using the 20- or 23-G technique showed that, especially in pseudophakic eyes, the results of both techniques are not significantly different in terms of the single reattachment rate (77%) and the visual outcome (0.4 ± 0.4 logMAR at the 6-month visit), and did not confirm the superiority of one technique over the other for the repair of nonsevere rhegmatogenous RD. The 23-G TSV technique allows the surgeon to reach the same objectives as the 20-G technique, but with its own limitations and potential complications. Further prospective studies are required to evaluate the expected increase in quality of life after 23-G TSV.

Table 1: Preoperative demographics of 70 patients operated for rhegmatogenous retinal detachment by 20-gauge or 23-gauge pars plana vitrectomy

	Overall (n=70)	20-G PPV (n=35)	23-G PPV (n=35)	P-value
Sex				
Female	30.0 (42.9)	15.0 (42.9)	15.0 (42.9)	0.99
Male	40.0 (57.1)	20.0 (57.1)	20.0 (57.1)	
Eye				
Right	32.0 (45.7)	17.0 (48.6)	15.0 (42.9)	0.63
Left	38.0 (54.3)	18.0 (51.4)	20.0 (57.1)	
Age (years)	62.4 ± 16.1	61.4 ± 16.6	63.4 ± 15.7	0.68
Symptoms				
Photopsia	26.0 (37.7)	13 (38.2)	13 (37.1)	0.92
- Duration (days)	11.1 ± 43.1	5.6 ± 9.5	16.4 ± 59.7	0.66
Floaters	43.0 (62.3)	19.0 (55.9)	24.0 (68.6)	0.28
- Duration (days)	27.6 ± 68.5	14.3 ± 32.7	41.2 ± 90.5	0.30
Visual acuity loss	62.0 (89.9)	30.0 (88.2)	32.0 (91.4)	0.66
- Duration (days)	7.0 ± 7.0	7.2 ± 6.9	6.8 ± 7.3	0.59

Preoperative visual acuity (LogMar)	1.2 ± 0.9	1.2 ± 0.9	1.1 ± 1	0.57
Preoperative visual acuity				0.5
20/20–20/40	16.0 (22.9)	6.0 (17.1)	10 (28.6)	
20/50–20/160	17.0 (24.3)	11.0 (31.4)	7.0 (20.0)	
20/200–20/400	8.0 (11.4)	4.0 (11.4)	3.0 (8.6)	
≤ hand motions	29.0 (41.4)	14.0 (40.0)	15.0 (42.8)	
Intraocular pressure (mmHg)	13.7 ± 4.2	14.1 ± 4.4	13.3 ± 4.1	0.84
Axial length (mm)	24.1 ± 1.7	24.3 ± 1.5	23.9 ± 1.8	0.32
Severe myopia (≥26 mm)	8.0 (22.6)	4.0 (11.4)	4.0 (11.4)	0.9
Lens status				0.99
Pseudophakic	54.0 (77.1)	27.0 (77.1)	27.0 (77.1)	
Phakic	16.0 (22.9)	8.0 (22.9)	8.0 (22.9)	
Status of the posterior capsule in pseudophakic eye (n=54)				0.8
Intact capsule	26 (48.1)	13 (48.1)	13 (48.1)	
Capsular rupture	7 (13.0)	3 (11.1)	4 (14.8)	
Posterior capsulotomy	21 (38.9)	11 (40.7)	9 (37.0)	
Time between cataract surgery and retinal detachment (months)	53.6 ± 42.5	58.5 ± 43.2	49.1 ± 42.2	0.37

Time between capsulotomy and retinal detachment (months)	42.7 ± 44.9	45.6 ± 43.6	38.6 ± 49.4	0.62
--	-------------	-------------	-------------	------

Table 2: Characteristics of rhegmatogenous retinal detachment before surgery

	Overall	20-G PPV	23-G PPV	P-value
Attached macula	26.0 (37.1)	13 (37.1)	13 (37.1)	0.99
Number of breaks:				
Preoperatively	1.4 ± 1.5	1 ± 1.3	1.7 ± 1.6	0.02
Intraoperatively	2.7 ± 2.2	2.5 ± 1.8	2.9 ± 2.5	0.96
Inferior tears	12.0 (17.1)	4.0 (11.4)	8.0 (22.9)	0.2
On detached retina	7.0 (10.0)	2.0 (5.7)	5.0 (14.3)	0.23
Number of tears with size > 1 optic disc diameter	0.4 ± 0.7	0.3 ± 0.7	0.4 ± 0.6	0.53
Proliferation vitreoretinopathy				0.6
PVR A	19 (27.1)	8 (22.9)	11 (31.4)	
PVR B	17 (24.3)	10 (28.6)	7 (20)	

Table 3: Details of surgical operations

	Overall	20-G PPV	23-G PPV	P-value
Pupillary dilation (mm)	7.8 ± 1.1	7.8 ± 1.3	7.8 ± 1.0	0.54
Total number of cryotherapy applications	7.7 ± 4.3	7.4 ± 3.7	8.03 ± 4.9	0.80
Number of applications on retinal tears	5.9 ± 3.5	5.7 ± 3.3	6.03 ± 3.8	0.86
Gas tamponade				<0.001
SF6	40.0 (57.1)	10.0 (28.6)	30 (85.7)	
C2F6	30.0 (42.9)	25.0 (71.4)	5 (14.3)	
Intraoperative complications	8 (11.4)	4 (11.4)	4 (11.4)	0.99
Operation time (min)	70.6 ± 21.9	71.3 ± 23.1	69.8 ± 20.9	0.6

Table 4: Postoperative examination at 1st day (D1), 1 month (M1) and 6 months (M6)

	Overall	20-G PPV	23-G PPV	P-value
Day 1 intraocular pressure	17.5 ± 7.2	18.4 ± 6.7	16.9 ± 7.8	0.17
Day 1 gas bubble ≥ 75% of the vitreous cavity	66.0 (94.3%)	33.0 (94.3%)	33.0 (94.3%)	0.99
M1 postoperative visual acuity (LogMAR)	0.6 ± 0.7	0.4 ± 0.4	0.7 ± 0.9	0.34
M1 visual acuity				0.3
20/20–20/40	33.0 (47.1)	17.0 (48.6)	16.0 (45.7)	
20/50–20/160	23.0 (32.9)	13.0 (37.1)	10.0 (28.6)	
20/200–20/400	5.0 (7.4)	1.0 (3.0)	4.0 (11.4)	
≤ hand motions	7.0 (10.0)	2.0 (5.7)	5 (14.28)	
M1 intraocular pressure (mmHg)	15.6 ± 4.7	16.0 ± 5.5	15.3 ± 4.0	0.72
M6 postoperative visual acuity (LogMAR)	0.4 ± 0.4	0.4 ± 0.4	0.4 ± 0.4	0.93
M6 visual acuity				0.7
20/20–20/40	38.0 (54.3)	19.0 (54.2)	20.0 (57.1)	
20/50–20/160	23.0 (32.9)	13.0 (37.1)	10.0 (28.6)	
20/200–20/400	4.0 (5.7)	1.0 (2.9)	3.0 (8.6)	
≤ hand motions	4.0 (5.7)	2.0 (5.9)	2.0 (5.7)	
M6 intraocular pressure (mmHg)	14.1 ± 2.8	14.7 ± 2.4	13.5 ± 3.1	0.19

Cataract surgery before M6	3.0 (18.8)	1.0 (12.5)	2.0 (25.0)	0.49
Number of cataracts at M6	9.0 (56.3)	4.0 (50.0)	5.0 (62.5)	0.49
Single-operation success rate	54 (77.1)	26 (74.3)	28 (80)	0.6
Attached retina at M6	66.0 (94.3)	34.0 (97.1)	32.0 (91.4)	0.30
M6 macula status				0.91
Normal	56.0 (82.4)	29.0 (85.3)	27.0 (79.4)	
Epiretinal membrane	7.0 (10.3)	3.0 (8.8)	4.0 (11.8)	
Macular hole	3.0 (4.4)	1.0 (2.9)	2.0 (5.9)	

Table 5: Final examination

	Overall	20-G TSV	23-G TSV	P-value
Follow-up period (months)	8.5 ± 4.1	9.1 ± 4.5	8 ± 3.7	0.26
Final visual acuity (LogMAR)	0.4 ± 0.5	0.3 ± 0.4	0.4 ± 0.5	0.67
Final visual acuity				0.7
20/20–20/40	43 (61.4)	22 (62.9)	21 (60)	
20/50–20/160	18 (25.71)	10 (28.57)	8 (22.86)	
20/200–20/400	4 (5.71)	1 (2.86)	3 (8.57)	
≤ hand motions	5 (7.14)	2 (5.71)	3 (8.57)	
Final intraocular pressure	14.1 ± 3.0	14.5 ± 2.4	14.0 ± 3.2	0.88
Final anatomical outcomes				0.99
Reattached retina	68.0 (97.1)	34.0 (97.1)	34.0 (97.1)	
Number of cataracts at final examination	4.0 (25)	1.0 (12.5)	3.0 (37.5)	0.23
Cataract surgery after M6	7.0 (43.8)	3.0 (37.5)	4.0 (50)	0.23

References

1. Weichel ED, Martidis A, Fineman MS, et al. Pars plana vitrectomy versus combined pars plana vitrectomy-scleral buckle for primary repair of pseudophakic retinal detachment. *Ophthalmology* 2006; 113:2033-2040.
2. Devenyi RG, de Carvalho Nakamura H. Combined scleral buckle and pars plana vitrectomy as a primary procedure for pseudophakic retinal detachments. *Ophthalmic Surg Lasers* 1999; 30:615-618.
3. Stangos AN, Petropoulos IK, Brozou CG, et al. Pars-plana vitrectomy alone vs vitrectomy with scleral buckling for primary rhegmatogenous pseudophakic retinal detachment. *Am J Ophthalmol* 2004; 138:952-958.
4. Heimann H, Bartz-Schmidt KU, Bornfeld N, et al. Scleral buckling versus primary vitrectomy in rhegmatogenous retinal detachment: a prospective randomized multicenter clinical study. *Ophthalmology* 2007; 114:2142-2154.
5. Azad RV, Chanana B, Sharma YR, Vohra R. Primary vitrectomy versus conventional retinal detachment surgery in phakic rhegmatogenous retinal detachment. *Acta Ophthalmol Scand* 2007; 85:540-545.
6. Brazitikos P. Scleral buckling versus primary vitrectomy. *Ophthalmology* 2006; 113:1245; author reply 1245-1246.
7. Campo RV, Sipperley JO, Sneed SR, et al. Pars plana vitrectomy without scleral buckle for pseudophakic retinal detachments. *Ophthalmology* 1999; 106:1811-1815; discussion 1816.
8. Pournaras CJ, Kapetanios AD. Primary vitrectomy for pseudophakic retinal detachment: a prospective non-randomized study. *Eur J Ophthalmol* 2003; 13:298-306.

9. Mendrinos E, Dang-Burgener NP, Stangos AN, et al. Primary vitrectomy without scleral buckling for pseudophakic rhegmatogenous retinal detachment. *Am J Ophthalmol* 2008; 145:1063-1070.
10. Ahmadi H, Moradian S, Faghihi H, et al. Anatomic and visual outcomes of scleral buckling versus primary vitrectomy in pseudophakic and aphakic retinal detachment: six-month follow-up results of a single operation--report no. 1. *Ophthalmology* 2005; 112:1421-1429.
11. Sharma YR, Karunanithi S, Azad RV, et al. Functional and anatomic outcome of scleral buckling versus primary vitrectomy in pseudophakic retinal detachment. *Acta Ophthalmol Scand* 2005; 83:293-297.
12. Hilton GF, Josephberg RG, Halperin LS, et al. Office-based sutureless transconjunctival pars plana vitrectomy. *Retina* 2002; 22:725-732.
13. Eckardt C. Transconjunctival sutureless 23-gauge vitrectomy. *Retina* 2005; 25:208-211.
14. Konstantinidis L, Berguiga M, Beknazar E, Wolfensberger TJ. Anatomic and functional outcome after 23-gauge vitrectomy, peeling, and intravitreal triamcinolone for idiopathic macular epiretinal membrane. *Retina* 2009; 29:1119-1127.
15. Lott MN, Manning MH, Singh J, et al. 23-gauge vitrectomy in 100 eyes: short-term visual outcomes and complications. *Retina* 2008; 28:1193-1200.
16. Hikichi T, Matsumoto N, Ohtsuka H, et al. Comparison of one-year outcomes between 23- and 20-gauge vitrectomy for preretinal membrane. *Am J Ophthalmol* 2009; 147:639-643 e631.
17. Schweitzer C, Delyfer MN, Colin J, Korobelnik JF. 23-Gauge transconjunctival sutureless pars plana vitrectomy: results of a prospective study. *Eye (Lond)* 2009; 23:2206-2214.

18. Sood V, Rahman R, Denniston AK. Phacoemulsification and foldable intraocular lens implantation combined with 23-gauge transconjunctival sutureless vitrectomy. *J Cataract Refract Surg* 2009; 35:1380-1384.
19. Chieh JJ, Rogers AH, Wiegand TW, et al. Short-term safety of 23-gauge single-step transconjunctival vitrectomy surgery. *Retina* 2009; 29:1486-1490.
20. Misra A, Ho-Yen G, Burton RL. 23-gauge sutureless vitrectomy and 20-gauge vitrectomy: a case series comparison. *Eye (Lond)* 2009; 23:1187-1191.
21. Tewari A, Shah GK, Fang A. Visual outcomes with 23-gauge transconjunctival sutureless vitrectomy. *Retina* 2008; 28:258-262.
22. Wimpissinger B, Kellner L, Brannath W, et al. 23-Gauge versus 20-gauge system for pars plana vitrectomy: a prospective randomised clinical trial. *Br J Ophthalmol* 2008; 92:1483-1487.
23. Fine HF, Iranmanesh R, Iturralde D, Spaide RF. Outcomes of 77 consecutive cases of 23-gauge transconjunctival vitrectomy surgery for posterior segment disease. *Ophthalmology* 2007; 114:1197-1200.
24. Nagpal M, Wartikar S, Nagpal K. Comparison of clinical outcomes and wound dynamics of sclerotomy ports of 20, 25, and 23 gauge vitrectomy. *Retina* 2009; 29:225-231.
25. Park DH, Shin JP, Kim SY. Surgically induced astigmatism in combined phacoemulsification and vitrectomy; 23-gauge transconjunctival sutureless vitrectomy versus 20-gauge standard vitrectomy. *Graefes Arch Clin Exp Ophthalmol* 2009; 247:1331-1337.
26. Erakgun T, Egrilmez S. Surgical outcomes of transconjunctival sutureless 23-gauge vitrectomy with silicone oil injection. *Indian J Ophthalmol* 2009; 57:105-109.
27. Kim YK, Hyon JY, Woo SJ, et al. Surgically induced astigmatism after 23-gauge transconjunctival sutureless vitrectomy. *Eye (Lond)* 2009.

28. Inoue Y, Kadonosono K, Yamakawa T, et al. Surgically-induced inflammation with 20-, 23-, and 25-gauge vitrectomy systems: an experimental study. *Retina* 2009; 29:477-480.
29. Siqueira RC, Gil AD, Jorge R. Retinal detachment surgery with silicone oil injection in transconjunctival sutureless 23-gauge vitrectomy. *Arq Bras Oftalmol* 2007; 70:905-909.
30. Woo SJ, Park KH, Hwang JM, et al. Risk factors associated with sclerotomy leakage and postoperative hypotony after 23-gauge transconjunctival sutureless vitrectomy. *Retina* 2009; 29:456-463.
31. Tsang CW, Cheung BT, Lam RF, et al. Primary 23-gauge transconjunctival sutureless vitrectomy for rhegmatogenous retinal detachment. *Retina* 2008; 28:1075-1081.
32. Oliveira LB, Reis PA. Silicone oil tamponade in 23-gauge transconjunctival sutureless vitrectomy. *Retina* 2007; 27:1054-1058.
33. Holladay JT. Proper method for calculating average visual acuity. *J Refract Surg* 1997; 13:388-391.
34. The classification of retinal detachment with proliferative vitreoretinopathy. *Ophthalmology* 1983; 90:121-125.
35. Schubert HD. Postsurgical hypotony: relationship to fistulization, inflammation, chorioretinal lesions, and the vitreous. *Surv Ophthalmol* 1996; 41:97-125.
36. Ernster VL. Nested case-control studies. *Prev Med* 1994; 23:587-590.
37. Langholz B. Case-Control Study, Nested. In: PCT A, editor. *Encyclopedia of Biostatistics*. New York: John Wiley & Sons, 2005:646-665.
38. Miettinen OS. The matched pairs design in the case of all-or-none responses. *Biometrics* 1968; 24:339-352.
39. Heimann H, Hellmich M, Bornfeld N, et al. Scleral buckling versus primary vitrectomy in rhegmatogenous retinal detachment (SPR Study): design issues and implications. SPR Study report no. 1. *Graefes Arch Clin Exp Ophthalmol* 2001; 239:567-574.

40. Bland JM, Altman DG. Matching. *BMJ* 1994; 309:1128.
41. Brazitikos PD, Androudi S, Christen WG, Stangos NT. Primary pars plana vitrectomy versus scleral buckle surgery for the treatment of pseudophakic retinal detachment: a randomized clinical trial. *Retina* 2005; 25:957-964.
42. Martinez-Castillo V, Boixadera A, Verdugo A, Garcia-Arumi J. Pars plana vitrectomy alone for the management of inferior breaks in pseudophakic retinal detachment without facedown position. *Ophthalmology* 2005; 112:1222-1226.
43. Von Fricken MA, Kunjukunju N, Weber C, Ko G. 25-Gauge sutureless vitrectomy versus 20-gauge vitrectomy for the repair of primary rhegmatogenous retinal detachment. *Retina* 2009; 29:444-450.
44. Riemann CD, Miller DM, Foster RE, Petersen MR. Outcomes of transconjunctival sutureless 25-gauge vitrectomy with silicone oil infusion. *Retina* 2007; 27:296-303.
45. Quiroz-Mercado H, Garcia-Aguirre G, Ustariz-Gonzalez O, et al. Perfluorocarbon-perfused vitrectomy using a transconjunctival 25-gauge system. *Retina* 2007; 27:926-931.
46. Shimada H, Nakashizuka H, Mori R, Mizutani Y. Expanded indications for 25-gauge transconjunctival vitrectomy. *Jpn J Ophthalmol* 2005; 49:397-401.
47. Lai MM, Ruby AJ, Sarrafizadeh R, et al. Repair of primary rhegmatogenous retinal detachment using 25-gauge transconjunctival sutureless vitrectomy. *Retina* 2008; 28:729-734.
48. Horozoglu F, Yanyali A, Celik E, et al. Primary 25-gauge transconjunctival sutureless vitrectomy in pseudophakic retinal detachment. *Indian J Ophthalmol* 2007; 55:337-340.
49. Ooto S, Kimura D, Itoi K, et al. Suprachoroidal fluid as a complication of 23-gauge vitreous surgery. *Br J Ophthalmol* 2008; 92:1433-1434.

50. Teixeira A, Allemann N, Yamada AC, et al. Ultrasound biomicroscopy in recently postoperative 23-gauge transconjunctival vitrectomy sutureless self-sealing sclerotomy. *Retina* 2009; 29:1305-1309.
51. Parolini B, Romanelli F, Prigione G, Pertile G. Incidence of endophthalmitis in a large series of 23-gauge and 20-gauge transconjunctival pars plana vitrectomy. *Graefes Arch Clin Exp Ophthalmol* 2009; 247:895-898.
52. Singh A, Stewart JM. 25-gauge sutureless vitrectomy: variations in incision architecture. *Retina* 2009; 29:451-455.
53. Taban M, Ventura AA, Sharma S, Kaiser PK. Dynamic evaluation of sutureless vitrectomy wounds: an optical coherence tomography and histopathology study. *Ophthalmology* 2008; 115:2221-2228.
54. Taban M, Sharma S, Ventura AA, Kaiser PK. Evaluation of wound closure in oblique 23-gauge sutureless sclerotomies with visante optical coherence tomography. *Am J Ophthalmol* 2009; 147:101-107 e101.

THESE SOUTENUE PAR : Magali ALBRIEUX

TITRE:

COMPARATIVE STUDY OF 23-GAUGE VITRECTOMY VERSUS 20-GAUGE VITRECTOMY
FOR THE TREATMENT OF RHEGMATOGENOUS RETINAL DETACHMENT

Etude comparative de la vitrectomie transconjonctivale sans suture 23 gauge versus 20
gauge dans la chirurgie du décollement de rétine


CONCLUSION :


This prospective comparative study of Retinal Detachment surgery using the 20- or 23-
Gauge technique showed that, especially in pseudophakic eyes, the results of both
techniques are not significantly different in terms of the single reattachment rate
(77%) and the visual outcome (0.4 ± 0.4 logMAR at the 6-month visit), and did not
confirm the superiority of one technique over the other for the repair of nonsevere
rhegmatogenous RD. The 23-Gauge Transconjunctival Sutureless Vitrectomy technique
allows the surgeon to reach the same objectives as the 20-Gauge technique, but with
its own limitations and potential complications. Further prospective studies are
required to evaluate the expected increase in quality of life after 23-Gauge TSV.

VU ET PERMIS D'IMPRIMER


Grenoble, le 15.07.2010

LE DOYEN


B. SELE



LE PRESIDENT DE THESE


PROFESSEUR Jean-Paul Ronanvier



SERMENT D'HIPPOCRATE

Qui dias memorem laudes, repetámque fideles
 Ingenij dotes, Hippocratisque decus.
 Democriti auditor Phœbea, ó, Coë propago,
 Certius an quis te tradidit artis opes?

En présence des Maîtres de cette Faculté, de mes chers condisciples et devant l'effigie d'HIPPOCRATE,
 je promets et je jure d'être fidèle aux lois de l'honneur et de la probité dans l'exercice de la Médecine.

Je donnerai mes soins gratuitement à l'indigent et n'exigerai jamais un salaire au dessus de mon travail. Je ne participerai à aucun partage clandestin d'honoraires.

Admis dans l'intimité des maisons, mes yeux n'y verront pas ce qui s'y passe ; ma langue taira les secrets qui me seront confiés et mon état ne servira pas à corrompre les mœurs, ni à favoriser le crime.

Je ne permettrai pas que des considérations de religion, de nation, de race, de parti ou de classe sociale viennent s'interposer entre mon devoir et mon patient.

Je garderai le respect absolu de la vie humaine.

Même sous la menace, je n'admettrai pas de faire usage de mes connaissances médicales contre les lois de l'humanité.

Respectueux et reconnaissant envers mes Maîtres, je rendrai à leurs enfants l'instruction que j'ai reçue de leurs pères.

Que les hommes m'accordent leur estime si je suis fidèle à mes promesses.

Que je sois couvert d'opprobre et méprisé de mes confrères si j'y manque.