

-RXUQDO RI &OLQLFDO
2SKWKDOPRORJ\

([SHULPHQW

%D[DQW HW DO - &OLQ ([S 2SKW
KWWS G[GRL RUJ

5HVHDFK \$UWLFOH

2SHQ \$F

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'HSDUWPHQW RI 0HGLFDO %LRSK\VLV DQG ,QIRUPDWLWV UG)DFXOW\ RI 0HGLFLQH &KDUOHV 8QLYHUVL
&RUUHVSRLQLQ \$OLQD %D[DQW 'HSDUWPHQW RI 2SKWKDOPRORJ\ 8QLYHUVLW\ +RVSLWDO .UIORY
5HSXEOLF 7HO)D[DOLQD(GDLD ED[DQW#VH]QDP F]
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&RS\ULJKW %D[DQW \$' HW DO 7KLW LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGHU WKH WHUPV RI
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\$EVDUFW
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FORVXUH JODXFRPD 3\$* RSHQ DQJOH JODXFRPD 32\$* DQG SDWLHQWV ZLWK
K\SHUWHQVLRQ
0DWHULDQV DQG PHWKRG\ SDWLHQWV XQGHUJRLQJ SKDFRPHXOVLILFDWLRQ
FKDPEHU LQWUDRFXODU OHQV LPSODQWDWLRQV 3& ,2/ ZHUH GLYLGHG LQWR W
SDWLHQWV 32\$* H\HV SDWLHQWV DQG D FRQWURO JURXS H\HV S
6FKHLP SIOXJ FPHUD PHDVXUH WKH IROORZLQJ FKDQJHV WKDW RFFXUUHG LQ W
\$9 DQJOH \$\$ DQG FHQWDO FRUQDO WKLFNQHVV &&7 \$GGLWLRQDOO\ *R
HYDOXWH LQWUDRFXODU SUHVXUH ,23 \$OO PHDVXUHPHQWV ZHUH ILUVW WDNH
DQG PRQWKV SRVWRSHUDWLYHO\
5HVXO:MMQ PHDVXUH DW ZHHN DQG PRQWKV SRVWRSHUDWLYHO\ WKH PHDQ
DOO JURXS S WKRXJK PRWO\ LQ JURXS 3\$* +RZHYHU WKH 3\$* SD
SRVWRSHUDWLYHO\ ZHUH VWLOO VPDOOHU WKDQ WKH 32\$* DQG FRQWURO JURXS
S
7KH \$' \$9 DQG \$\$ GLIIHUQFHV EHWZHHQ WKH WKLUG ZHHN DQG PRQWK
LQVLJQLILFDQW S!
:H DOVR IRXQG LQVLJQLILFDQW SRVWRSHUDWLYH SDFK\PHWULF FKDQJHV ZKHQ
S! 7KH ,23 GHFUHDVHG WKURXJKRXW DOO SRVWRSHUDWLYH SHULRGV LQ DO
S
&RQFOXV\&DUDFW VXUJHU\ VLJQLILFDQWO\ LQFUHDVHG \$' \$9 DQG \$\$ LQ
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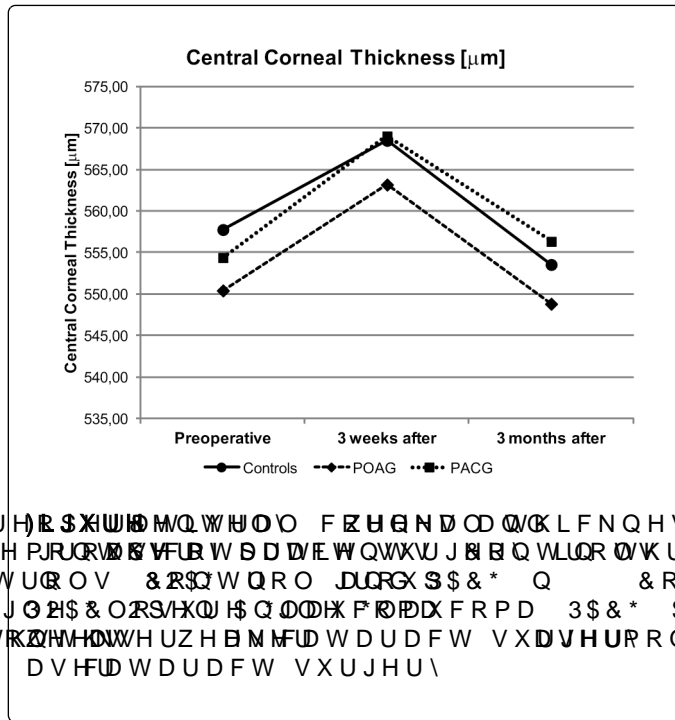
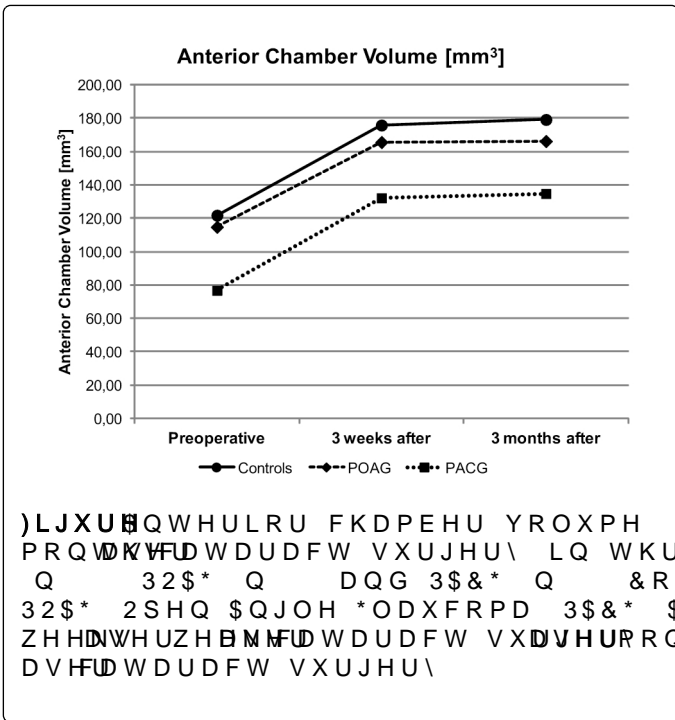
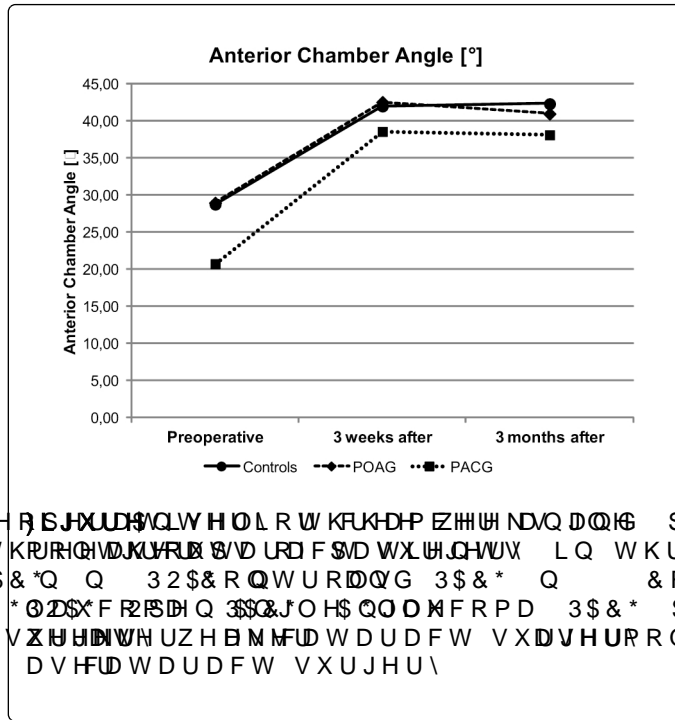
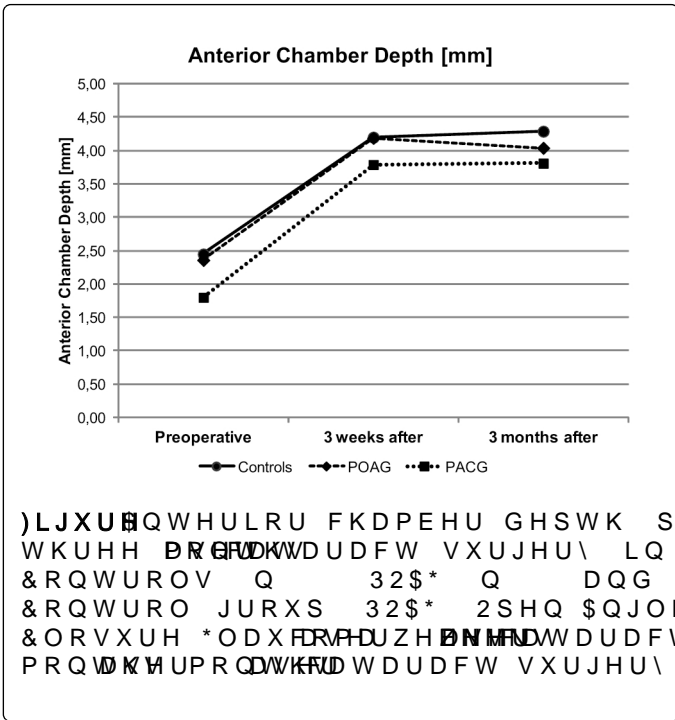
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> @
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ZLWK DJH DQG ZRUVHQV WKH YLVXDO DFXDWXU\ DQJRWLV DQG H\HSHFWLYHO\ R
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RQ WKH G\QDPLWV RI DTXHRXV KXPRU > @
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RSHQ DQJOH JODXFRPD 32\$* LW UHPDLGV YLXGDFLGHG ZKHWHU QRRJLHV
FKRRVH D VXUJLQDO SURFHGXUH DV D SHUPLWV FDWDUDFW VXUJHU\ R\W\QDUL
ZLW\W\XUJHU\ LQ RUGHU WR DFKLHYH SHUPLWV D\H\QLEFH LQWUDRFXODU
SUHVXUH ,23 > @
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0HDQV " 6'				S YDOXHV RI PXOWLSOH %RQIHUURQL WHVW		
3DUDPHWH	UJHRSHUDWL	YHZZHNV	PRQWKV	3UHRSHUDWL	YHZZHNV	PRQWKV
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&RQWURO *URXS Q - DJH " \HDUV						
\$&' >PP@	"	"	"	,	,	
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&&7 > P@	"	"	"			
32\$* Q - DJH " \HDUV						
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&&7 > P@	"	"	"			

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 WHVW \$&' DQWHULRU FKDPEHU GHSWK \$&9 DQWHULRU FKDPEHU YROXPH \$&\$
 32\$* RSHQ DQJOH JODXFRPD 3&\$* DQJOH FLDQXV DQXFRPD i KWDQV VVXHW
 S YV YHUVXV

H PHDQ \$&9 UHFRUGHG D VLPLODU WUHQG R FKDQJHV DV \$&' WKH PH DQXSV
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 RWKHU WZR JURXSV S)XUWKHUPHUP ZWKLRXQJ RWKHU WKH SRVWR
 \$&9 ZDV VLJQL}FDQV WOO WUHQG LQ WKH 32\$* JURXS SRVWRSHUDWLYH WKH \$&\$ YDOXH
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 WKH VWXGLHG JURXSV EHWZHHQ WKH WUHQG WUHQG WUHQG WUHQG WUHQG WUHQG
 FDWDUDFW VXUJHU\ 7DEOH

H FRUOHODWLRQV EHWZHHQ \$&9 YDOXH WUHQG WUHQG WUHQG WUHQG WUHQG WUHQG
 SRVWRSHUDWLYH FKDQJHV LQ FDOFXODWLRQV LQ FDOFXODWLRQV LQ FDOFXODWLRQV
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 FDWDUDFW VXUJHU\ WKH JUHDWHU WKH SRVWRSHUDWLYH FKDQJHV RI \$&9 7DEOH
 DQG)LJXUH



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 WR s PP+J DQG LQ WKH WKLUG PR
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RQ DTRXVMBZLOLW\ 2SKWKDOPRORJ\ DQJOHV \$UFK 2SKWKDOPRO
+D\DVKL . +D\DVKL + 1DNDR) +D\DVKL) *UHZDQDQJHULQ6DQVHQLRU *UHZDO 63
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H\HV ZLWK JODXFRPD 2SKWKDOPRORJ\ FRKHUHQFH WRPRJUDSK\ IRU GHWHFWLRQ RI
8@DNK22 2]NDQ 0 .DQSRODW \$ \$QWHULRU FKDPEHU
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SKDFRHPXOMQ)BWRVRO/HQVLYH H\HV \$FWD 2SKWKDOPROV XVLQJ 3HQWDFDP DQG SUHGLF
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XQHYHSDVDFRHPXOMQ)FDWDLRW VXUJHU\ (\H *URXS 2XWFRPHV RI DE LQWHUQR W
,VVDS 3DFKFR - 0DKPRRG 8 1RODQ - %HDWUDEHFWRP\$ 5RCHOUHQH\ DQJOH RSHQLQJ
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%U - 2SKWKDOPRO WKH 70 (/ \$,/ 1) NDSSD% UHVSRQVH D S
/LX &- &KHQJ &< :X &: /DX /, &KRX -& H[WUDRFXODULSUUHVFXUHDULQHQUVHOPSDVLDQDWDWVROQLRSD
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.LP " 'R\OH -: 6PLWK 0) ,QWUDRFXODULSUUHVFXUHDULQHQUVHOPSDVLDQDWDWVROQLRSDOPRO
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